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GOOD ROADS NUMBER

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# The Automobile

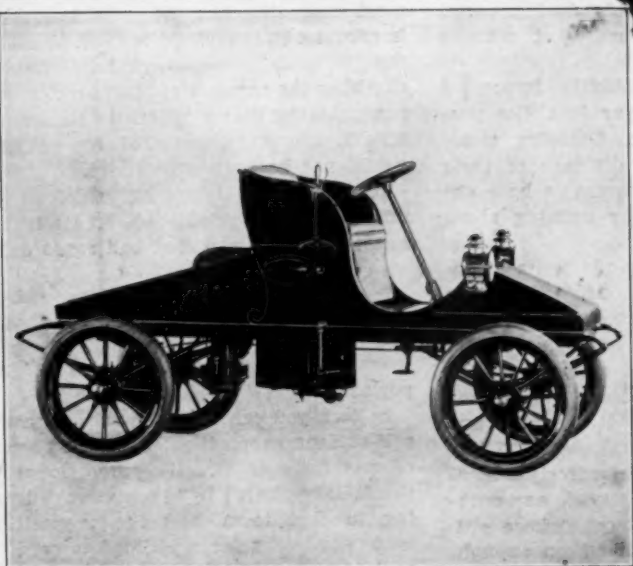
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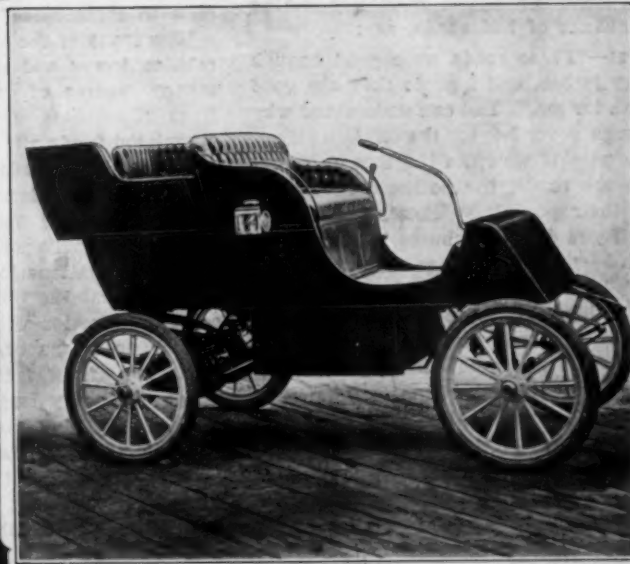
THE TOLEDO  
STEAM TOURING CAR.



THE RAMBLER  
GASOLINE RUNABOUT.



THE 12-HP. FOURNIER-SEARCHMONT.



THE WAVERLEY ELECTRIC TONNEAU.

SOME NEW TYPES AT THE CHICAGO SHOW.

## GOOD ROADS THE COUNTRY'S NEED.

Their Benefits and Practical Limitations Discussed by Well-Known Authorities.

### Good Roads and Rural Prosperity.

By Henry P. Morrison, C. E.

The farm wages an unequal competition with the city office and shop, not because it does not enjoy more of God's sunshine, nor yet because in the average expenditure it is less remunerative; but because it cannot supply the variety of human intercourse that is found in the city. Human beings go to the centres of population as the streams to the sea.

Rural communities, whose citizens with sorrow and regret witness the exodus of their youth from parental acres toward the city's doubtful inches—an exodus that is taking value from every farm, and inculcating the seeds of discontent in those who remain to work them—would naturally be expected to investigate the causes that lead to these doleful results. If there is any one factor which will go far toward remedying this evil, it is good roads, thereby reducing to the minimum the inaccessibility, and hence the dreaded isolation of country life.

The community that desires to retain its youth, which is anxious to unlock its acreage for the inspection of the investing world, and which is a candidate for admission to the ranks of progress, must "mend its ways."

The age or the lack of a dress-coat has made many a vacant dinner chair; so also the poor condition or lack of decent roads has wiped many a locality off the map, so far as the traveling public is concerned.

Why are many rural, and sad to say some suburban communities, slow to appreciate the fact that easy highway accessibility counts for more in the factors which go to make the success of a locality, than anything else that can be mentioned?

The reasons assigned ordinarily for the continuance of bad roads, are:

First—"These roads were good enough for my father, and I guess they are good enough for me." You can understand why that man never left for the city!

Second—"If we raise the money to improve the roads, the politicians will put it in their pockets." Possibly that is true, if you do not disburse it properly.

Third—"My taxes are high enough now." The same man would say the same thing if his taxes were cut in half.

While it is true that there are certain localities in which the cost of construction on an improved highway system would mean a practical confiscation of the property assessed, to pay for the improvement, it is also true, and must be a matter of the keenest interest to the citizens of such localities, that State after State is placing on its statute books obligations to aid localities, such as these,

from the proceeds of general taxation, in order that the highway system of the country may be improved, without regard to the poverty or wealth of the localities through which they pass; and in localities like this, it should be further remembered that a team, a scraper, a roller and intelligence will take something off the price of a barrel of flour, and let a bicycle and an automobile "come a-visiting."

Generally speaking, however, there is no community in which the present system of highways, where they require it, could not be sufficiently benefited to permit the outside world to at least find them easily and pleasantly accessible during seven months in the year, and that without State aid.

An observer is constantly impressed with the fact that many localities possessing good natural road-making material, within shoveling distance of their highways, do not even seem to have the necessary shovel, to say nothing about the power to move it.

The writer, in twenty-odd years of experience in highway construction, has found the communities possessing the best natural advantages less anxious to maintain their roads in good repair, than the communities with handicaps in the lack of road material, obstinate digging and prohibitory grades.

In this country there is scarcely a hamlet or cross-road community, to say nothing of hundreds of villages, whose citizens have not at some time been wrought up to the keenest point of pleasurable excitement by the rumor that a railroad was going to be built, which would have a station within their town. What visions of town lots, a bank, a new steeple for the meeting-house and additional liquor licenses! But the railroad almost always fails to materialize.

How many of the citizens of farming localities, towns and villages, far from the money centres of our land, have taken from their hard-earned and slowly-accumulated funds and built or aided in the building of railroads, in order that they might become citizens of the land of accessibility! The spectacle of counties, towns and villages exchanging their bonded obligations for railroad securities, in order that they might by that means secure connection with the outside world, has by no means been uncommon.

In view of the fact that railroads will never reach any large percentage of the localities desiring them, they being only possible where the assured return on the money invested in their construction is sufficient to warrant it, is it not strange that such localities should not cast about them for the next best attainable solution of the problem of rendering their po-

sition accessible to the greatest possible proportion of the traveling public?

If an investigation was started by such disappointed communities, they would find that, far from being helpless, their futures were largely what they wished to make them in the matter of prosperity. In other words, that if they will place their common highways in the best possible condition (this does not mean the



FIG. 1. GRAVEL OR SHALE. MAXIMUM DEPTH, 6 INCHES.

most expensive, but the most intelligent improvement, applying the most available and suitable material, helpful grades, checking the ravages of storm-water, and remembering that a "patch in time saves nine"), the non-coming of the railroad would not be such a calamity.

It would be a light task to defend the proposition that good roads create travel, hence business; and that bad roads delay



FIG. 2. 4-INCH MACADAM.

journeys and increase the cost of transportation.

In fact, you can close the case with the self-evident proposition, that the success of any town is directly proportional to the facility offered by the highways leading to that town, and the proposition holds good even for a railroad town, if it aspires to become a shipping point.

The fact that the railroads move the



FIG. 3. 6-INCH MACADAM.

country along fixed lines, has been materially modified by the introduction of the bicycle, which has transformed us into a nation of excursionists, and the automobile and the auto-truck are now lengthening out a thousandfold the heretofore possible journey of any vehicular traffic. This class of travel will gladly seek you out, although the railroad shuns you, if



FIG. 4. 8-INCH MACADAM.

you will only put your highways in decent repair, and keep them so.

The value of property, when it can be reached by the bicycle and motor-carriage traveler (and that value is hard to estimate, when one recalls the testimony of rural and suburban real estate men concerning the percentage of real estate sales that they annually close when the purchaser for the first time reaches the



scene of his investment on a wheel or auto), is always greater.

By improving your roads you lengthen out the heretofore movable months of your locality. In other words, your trade



FIG. 5. DIRT ROAD.

will not have to wait until the roads have dried up after the Spring thaws, in order to reach your store, nor will the arrival of heavy supplies be delayed. In fact, careful investigation of various localities



FIG. 6. MACADAM SECTION ON A FILL, WHERE IT IS NECESSARY TO CARRY STORM WATER ON WINGS.

as to present expenditures for highways, proves that it is actually less expensive to have good roads than it is to maintain poor ones.

Is the road system of your locality im-



FIG. 7. MACADAM SECTION ON A FILL, WHERE STORM WATER MAY BE ALLOWED TO FLOW ON ABUTTING PROPERTY.

proved? If not, how much money have you annually spent on your roads in the way of ditching, turnpiking, supplying broken stone or local road material, filling in wash-outs, and repairing broken culverts?



FIG. 8. TELFORD ROAD. 4-INCH MACADAM, 8-INCH FOUNDATION.

Ask your governing board to investigate the matter, and do not be surprised if it is found that your present annual expenditure on roads whose condition isolates you, increases the cost of your supplies and retards your development, is



FIG. 9. A SOFT SECTION ON A DIRT ROAD CAN BE PERMANENTLY HELPED BY AN INEXPENSIVE STONE DRAIN.

more than enough to pay the interest on bonds issued to build good roads, together with an amount sufficient for the annual maintenance of these roads, while the easy redemption of the bonds will be guar-



FIG. 10. THE TILE DRAIN WILL COST A LITTLE MORE AND PAY FOR ITSELF.

anteed by the increased values which the road improvement will bring you, to say nothing of probable State aid.

The close of the first quarter of this century will, in all probability, find our National Government maintaining, light-

ing and policing a great chain of interstate highways, while our State and local authorities will be performing like service within the limits of their respective juris-



FIG. 11. FIELD STONE BOTTOMING FOR STIFF CLAY.

dictions. Then will the automobile have for its operative field an unlimited mileage of continuously improved highways.

The good roads are coming. Why not be



FIG. 12. SUBURBAN STREET. BRICK ON CONCRETE, SAND CUSHION.

in the fore rank of the localities which shall hasten the day? There is compensation in it for your every expenditure.

There is pleasure in it for you in every



FIG. 13. AN EXTREME CASE.

stranger's face that comes a-wheel. There is excitement in it for you in the flash and dash of the noiseless device that grinds up distance while the second-hand hesitates.



FIG. 14. GRANITE ON CONCRETE.

The good roads are coming, and until they shall have come our civilization is incomplete.

### Good Roads--What This Means and Where Found.

By H. B. Fullerton.

Fire and brimstone, rain and hail, snow and ice have terrors galore for the just and for the unjust. They enter in and effect almost every thing living and things inanimate. There is one evidence of civilization, however, for which these things have no terrors, and that is a well-drained, properly-constructed highway; and let us add, and that quickly, lest damage be done, that the road to be thoroughly good and beyond danger of destruction by either the elements or man must have its roof properly repaired, and this by the use of material which science, backed by years of practical experience, has shown to be best.

Years ago a Good Roads advocate was called a crank; later it was said by the wise ones that a Good Roads advocate had a harmless but tiresome fad; within a few short years he became a Good Roads enthusiast, and to-day he is buried and lost sight of by the uprising of the people, who at least have opened their eyes and read a little, thought a good deal more, and by watching the growth of communities

advanced enough and clever enough to carry out systematically the building of permanent highways, to note that a Good Road not only means a safe and certain means of travel throughout every one of the twelve months of the year, but further is an absolute economy from any point of view. This statement is not a mere theory, as it long was supposed to be, but is an absolute fact tested by everyone who has had the good fortune to live in an advanced and civilized community in the United States.

Back in the early history of the dawn of civilization the conquering nation was always one which knew enough to realize that the most vital requisite for conquering, for growing richer, for gaining empire, was a good road, for quick communication with the base of supplies, for the rapid bringing forward of new troops and engineers of destruction; and so systematically was this carried out that in the invasion of Great Britain by the Romans roads that were then built not only served their purpose, but exist up to the present time, in many cases in spite of generations of neglect. All Europe, in fact, is grid-ironed by Good Roads, in some countries purely as military necessities, in some for the development of districts almost absolutely inaccessible except for permanent and well-kept roads. The United States alone of all civilized countries to-day is without a Good Roads system. Isolated cases there are. Good Roads object lessons without number have been built, but with the exception of two states nothing that can be called real progress looking toward the establishment of a national system of roads has been made. To New Jersey and Massachusetts belongs the credit of pushing this work forward and appropriating year after year liberal sums of money to make possible, no matter what the vagaries of the weather, communication between their large cities, between the country which is the base of supplies and consumers in the cities, and further communication with the states joining them. New Jersey undoubtedly leads, the object being to connect the outlying districts with their natural center, with the particular city purchasing the products of the agriculturists, the city from which the stock raiser, the farmer and the gardener draw supplies for carrying on the occupation and for supplying the family needs.

Massachusetts followed suit, and works on somewhat similar lines, but has laid particular stress upon the building of trunk lines running for miles the length of the state and roads crossing the state at logical points. The Empire State must perforce be given credit for standing next in line. It is true that for years absurd and really valueless appropriations were made; valueless because the sum was barely large enough to cover the necessary expenses of thoroughly suiting the needs and planning the improvements

needed. Fifty thousand dollars was the sum of money until New York secured in Edward A. Bond, the present State Engineer, and William Pierson Judson, his able assistant, men who were vitally interested in the subject, and knew thoroughly, not only Europe historically, but

methods peculiarly American, is in good condition. Crossing the Island from north to south, every highway of any importance at all was macadamized. In all 600 miles of the finest road system in the Empire State is now in the territory making Queens and Nassau counties, the western

ily 4,000 pounds over exactly the same territory, thus reducing the very serious item of transportation cost, and further enabling this same team to draw quickly fertilizer or other needed supplies. The roads have done away with the necessity of adding further to the cost of production by the hiring of extra teams in very wet weather or in hilly country. They have lengthened to a marked extent the life of a horse and vehicle, besides increasing the drawing capacity of the draft horse and thus reducing cost; they have further reduced the time necessary to cover certain distances to a very marked extent. They have increased the value of farm lands, because such lands are now accessible always; they have made it possible for those of moderate salary to live well with ample land about them, instead of being obliged for pure economy's sake to live in tenements or close, unhealthy, poorly-constructed flats in the city. They have been the means of drawing manufactories of many kinds to a territory in close touch with the greatest market of the United States. Their value to a community cannot be overestimated; and when it is understood that the cost of rebuilding dirt highways each spring in a small county runs from \$60,000 to \$80,000 annually, and all this money absolutely lost, as the road is not permanent, and each year must be renewed, without going into figures, it is easy for anyone to estimate the saving to a community in absolute dollars and cents of taxation when permanent highways are substituted for mud-pie mixtures.



FIG. 1. END OF THE JERICHO TURNPIKE, L. I.

the history of the advance that had followed even sporadic attempts at road building in the United States. With Good Roads enthusiasts they worked and in many ways preached the gospel of Good Roads in every section of New York State. They gave the facts and figures to prove the direct benefit and quick relief from the fearful burden of expense of making a mud road good for a little time during the dry weather and destroyed absolutely with the first storm, to remain throughout the inclement weather a series of bogs, lumps, ridges and holes, adding tremendously to the cost of marketing produce and of hauling supplies, destroying or crippling live stock and making necessary cumbersome and unwieldy wagons, which, no matter how well built, were racked to pieces in an incredibly short time. Outside of a few cities, such as Brooklyn and Buffalo, no concerted movement with science at its head was made to improve the highways of the Empire State in the country districts until the west end of Long Island took hold of the matter and the counties of Queens and Nassau improved not only their three great trunk lines, the Merrick Road on the south or ocean side, the Jericho turnpike running directly through the center of the Island, and the North or Hempstead road. This latter road was the first one built. The county engineers at that time, backed by the county officials, would not build anything but a practical, scientific, permanent stone road, and suffered delay for years rather than give the people a make-shift. Their wisdom is shown from the fact that the road to-day, although cared for by

half of Long Island, which is the coast of New York State.

To these roads is directly traced a great advance in land values and the prosperity of those making Long Island their home. They give to the outlying districts quick and at all times easy access to the towns



FIG. 2. A ROAD IN SAG HARBOR, L. I.

and villages and to the railroad stations. They give to the raiser of vegetables, fruits, or flowers, an absolutely sure method of transporting produce to the great markets of Greater New York. They enable a two-horse team, which formerly hauled 1,000 pounds, to to-day draw read-

The average county can borrow money at from 3 to 3½ per cent, can quickly construct permanent highways, and at smaller annual expense than is now thrown away by pennywise and pound foolish Supervisors, own in from seventeen to eighteen years their roads abso-





KEY PORT AND KEANSBURGH ROAD, MONMOUTH COUNTY,  
BEFORE STONING.



KEY PORT AND KEANSBURGH STONE ROAD, MONMOUTH COUNTY.



EGG HARBOR AND GREENBANK ROAD, ATLANTIC COUNTY,  
BEFORE IMPROVEMENT.



EGG HARBOR AND GREENWICH ROAD, ATLANTIC COUNTY, 1½  
MILES OUT OF EGG HARBOR, AFTER IMPROVEMENT.



AMWELL ROAD, NEW BRUNSWICK, E. MILLSTONE,  
SOMERSET COUNTY, BEFORE IMPROVEMENT.



HADDONFIELD AND MT. EPHRAIM ROAD, CAMDEN COUNTY,  
AFTER IMPROVEMENT.

HIGHWAY IMPROVEMENT IN NEW JERSEY.

lately free from any incumbrances, the annual maintenance cost for the macadam road being extremely low. On the roads receiving the lightest travel nothing need be done for two or three years; on the main trunk lines trifling repairs must be made when breaks occur.

Let us compare the highway with a house. A properly-built house has a good foundation, so placed that it has good drainage. It is constructed then of material to defy the weather. On top it has a roof. In every item the road follows the house closely. Its roof, like the roof of the house, must be kept free from leaks. When a shingle blows off of the house it is replaced at once. If this is not done, destruction continues until the interior of the house is opened to the ravages of the weather, and is destroyed. So with the road. Its foundation must be good. Good drainage is a necessity. The bed must not be very thick, but must be thoroughly packed by rolling. On top, the roof is placed. This roof serves two purposes, one like that of the house roof. It sheds the water into the drains and prevents it entering the road and permitting ice or thaws to form. It serves another purpose: it takes the weather. It need not be thick. A quarter of an inch of any cementitious rock crushed fine is rolled by the wheels into a firm, unyielding roof, taking all the wear until it is absolutely worn away, when, of course, it must be replaced or stones below will be picked up by the horses' hoofs.

Many American roads properly built are not properly cared for. Alleged experts, with a knowledge of the dirt roads of the past, throw water-worn sand upon the roads. This is of absolutely no value. The first rain carries it into the drains and stops them. Each wagon as it goes along rolls it off. It is a hindrance to travel, and of no more value to a road than marbles of larger size would be. Others in making road repairs throw upon the surface loam and even sods. This is worse, if possible, than sand. It not only holds the water, but makes of the surface a close approach to the dirt road of the past.

### Limitations on Road Improvements.

By Ira O. Baker, M. Amer. Soc. C. E.  
Professor of Civil Engineering, University of Illinois.

I am informed that THE AUTOMOBILE for April is to be a Good Roads Number, and am requested to write on "what is possible in road improvement under existing conditions." There is hope when it is recognized that present conditions are an important factor in proposed innovations. Much of the agitation for good roads in the past has neglected the limitations of present conditions, and consequently in some respects has done harm in all communities, and in many respects

has done more harm than good in most localities.

#### ROAD ADMINISTRATION.

In the past it has been very common to cite the roads of England, France, and Switzerland as examples of what the United States could and should do, regardless of the fact that those countries are abundantly supplied with good road-building materials, while in this country there are areas greater than the combined area of those countries in which there is absolutely no suitable road-building material. Again, the stone wagon-roads in those countries were built under the stimulus of military necessity and commercial need before the advent of the steam railroad; while in the greater part of this country the railroads have been the pioneers, and now there is no commercial need of long lines of wagon transportation, except perhaps in the immediate vicinity of the large cities. Further, the density of population, the industrial occupation, the agricultural methods are very different in those countries from those prevailing in this. Still again, the method employed in maintaining wagon roads in those countries, with their dense and poorly-paid population, is no criterion by which to judge what is wise or possible in this country. And once more, the political and social ideals on the two sides of the Atlantic are very different, and make possible certain results in Europe which are absolutely impossible at present in this country. Finally, the best-built stone roads in America are vastly superior to any in the Old World. The limitations of high-priced hand-labor have compelled American engineers to utilize machinery, if they are to construct stone roads at all; and as a consequence there has been developed in this country a system of stone-road building that gives cheaper and better results than the much-vaunted European roads. Therefore, he who seeks to improve American wagon roads must study American conditions; or, better, he who seeks to improve the wagon roads of a particular locality must study the local conditions.

Almost, if not absolutely, universally in this country the administration of road affairs is in the hands of small local official boards, which, from the nature of our form of government, are liable to change frequently. This condition imposes a well-nigh insurmountable limitation upon any comprehensive and continuous system of road improvement, unless the public generally firmly believes in the value of the proposed system. Therefore, it is highly important that correct information concerning road economics, road administration, and road construction should be widely disseminated. It is probable that no important and lasting improvement in road matters can be secured by legal enactment except when supported by an intelligent and active

public sentiment. Numerous examples could be cited where the higher legislative powers have passed laws to be enforced by the local authorities which have rested in entire desuetude. The dominating spirit of our system of government is home rule in road matters as well as in many other things, and the local community is not likely to relinquish the rights it has long exercised, until the public is convinced that by so doing it is not falling from the frying pan into the fire.

It is frequently claimed that the roads would be better cared for if it were done by men who gave all their time to that work. This plan has some promising advantages, and is probably a necessity for the maintenance of first-class broken-stone roads, having any considerable amount of travel; but it is impracticable for truly rural roads, whether of broken stone or earth. The amount of labor required is so small that the care-taker would have so great a length under his charge that he could visit each section only at comparatively long intervals, and, therefore, could not become intimately acquainted with the road and could not do the work at the most favorable time.

In the past not a few writers upon road improvements have claimed that the labor tax was the chief cause of bad roads. It is unquestionably true that often a farmer does not work with as much energy when paying his labor road-tax as when working in his own field; but it is equally true that no man works for the public with as much energy as for himself. Road reformers must recognize that human nature will manifest itself very much the same in road affairs as in other matters of life. It is not proven that changing from the labor-tax to the cash-tax system would not be going from bad to worse. In the first place, the disease is not as serious as charged, many farmers giving even more labor than is exacted. In the second place, road taxes are in effect assessed by farmers, and paid by farmers; and farmers would probably pay two dollars in labor than one in cash. In the third place, the officials that permit inefficiency under the labor-tax system, will probably permit equal inefficiency under the cash-tax system. There are some minor features of the labor vs. the cash-tax question that are worthy of consideration, but space is not here available. City streets are maintained on the cash-tax system. Are they better or more economically cared for than country roads? The writer has had a wide opportunity to compare the conditions in six or eight counties of Illinois, and also in a few other localities in other states, and his observation is that the streets of the village and small cities are not as well cared for as the roads in the surrounding country. Farther, the writer is of the opinion that, as a rule, the streets of even the large cities are not as well nor as



economically cared for as the rural highways. There would be some justice in arguing that this condition was proof that the cash-tax system was not as efficient as the labor-tax; but the writer does not so regard it, since there are more important conditions that control in the management of both city streets and country roads. When there is a leak in the roof, it is foolish to argue whether another coat of whitewash or some new wall paper will remove the spot on the ceiling. The difference between the labor and the cash tax has but little to do with the condition or cost of the roads. The writer has repeatedly seen excellent roads under each system, and immediately adjoining has seen very poor ones under both systems. The chief defect in the construction and maintenance of American highways is the lack of intelligent and effective supervision. We shall never have the first until there is worked out for each locality a system of rules, either traditional or printed, for the care and improvement of the public highways; and we shall never secure the second until the public generally comes to believe in the value of better roads.

#### ROAD ECONOMICS.

In the past much has been said about the value of good roads to the rural communities; but those whom it was sought to influence have not admitted either the premises or the logic, and hence very naturally have not accepted the conclusions of the would-be reformer. The individual farmer cares very little for the statement that such and such results represent the average of the replies received from 10,000 letters to farmers. The man who hauls the produce to market thinks he knows what it would be worth to him to have the roads improved; and he also thinks he knows something about what it would cost to improve them. The representative farmer is not much influenced, at least not favorably, by statistics drawn from conditions within 20 or 30 miles of the largest city on this continent. Apparently the only effect of such arguments has been to make the rural resident believe that some one is trying to get him into a trap; and consequently he is suspicious and turns a deaf ear to all suggestions for road improvement which do not come from those with whose motives he is acquainted. He knows that while good roads may have greatly enhanced the value of real estate in the bed room of some great city, such conditions can not be widespread. The representative farmer understands the difference between the conditions under which he labors and those of the huckster near a large city. Even though hard roads may enable a farmer now and then to rush to town with a dozen eggs, or a bushel of potatoes, or perhaps a load of hay, and obtain a fabulous price, he knows that these conditions are exceptional, and also that if any considerable number of hard roads are built producers must accept the general level of

prices. The Illinois farmer understands the difference between his state and Indiana in the matter of the proximity of road-building material; and he also understands the difference between the rich sticky soil of his own state and that of Massachusetts, and believes that the experience in the Bay State is not a trustworthy guide for him. Road reformers must recognize such facts and govern themselves accordingly, if they can reasonably hope to accomplish anything more than to anger those they desire to convert. It may add spice to the article to make frequent use of such terms as "hayseed," "wayback" and "ignoramus," or to embellish it with pictures showing wagons literally half buried in mud; but any man with half sense knows that these conditions are not representative. Would it not be the height of folly for an attorney to employ such tactics with the jury, and then expect to obtain a favorable verdict?

A child can not run before he is able to walk. The first step to better things is to make the best use of the present conditions. In this country we now have the best system of railroads in the world, but in the beginning no attempt was made to build after the pattern of European railroads. The early railroads were fitted to the available resources of the country, and continued to improve as the country improved. It is certain that if railroad promoters or railroad engineers had at first insisted upon the highest conceivable type of railroads, this country would not to-day occupy its present prosperous position. It is desirable that wagon-road improvement shall follow the same general course as the development of our railroads. It is easier to grow into better things than to seek to attain the desired end at a single bound; and it is safer to attempt improvement through reform than by revolution. Until a community makes and maintains reasonably good earth roads, it is useless to urge the advantages of broken-stone roads. In most communities for many years to come, the only wagon road must of necessity have earth surfaces; and under any and all conditions many of the roads in all communities will be earth ones. Fortunately the steps required for the proper construction and care of the earth roads are also the very best preparation for gravel or broken-stone surfaces. At present all that is feasible in most rural communities is to seek to establish a better system of constructing and maintaining the earth roads.

#### Earth Road Construction and Maintenance.

By Ira O. Baker, C. E.

It is impracticable here to enter upon any comprehensive consideration of the principles of road construction; but there are a few elements that are so frequently neglected as to justify a brief mention.

**UNDERDRAINAGE.** This element is

equally as important in the construction of a pavement as of an earth road. The three objects in constructing an artificial road surface, i. e., a pavement, are: (1) to make a smooth surface for the traffic, (2) to secure a roof that will keep water from percolating to the subgrade, and (3) to distribute the concentrated load of the wheel over a sufficient area of the subgrade so that the soil can support the load. The distributing power of a pavement depends either upon its thickness or upon the rigidity of the concrete foundation. Drainage increases the supporting power of the soil, and is consequently a means either of increasing the stability of the pavement or of decreasing its thickness and cost. Not infrequently it would be better to spend more money for drainage and less upon the pavement proper. Ordinarily underdrainage costs nothing for maintenance or reconstruction. Since an earth road has no impervious roof nor a layer for distributing the concentrated pressure, any means of increasing the bearing power of the soil is of vital importance.

Many, if not most, country highways could be considerably improved by thorough underdrainage. Most roads need underdrainage even though water does not stand in the side ditches. Most people appear to think that the sole object of tile drainage is to remove the surface water, but this is only a small part of its purpose. The most important object of underdrainage is to lower the water level in the soil. The action of the sun and the breeze will finally dry the surface of the road; but if the foundation is soft and spongy, the wheels will wear ruts and the horse's feet will make depressions between the ruts. The first shower fills these depressions with water, and the road is soon a mass of mud. A good road can not be maintained without a good foundation, and an underdrained soil is a poor foundation. A second object of underdrainage is to dry the ground quickly after a freeze. A third, and sometimes a very important, object of subdrainage is to remove what may be called the underflow. Finally, the underdrainage of a road not only removes the water, but prevents, or greatly reduces, the destructive effect of frost. Frost is destructive only where there is moisture. If the roads are kept dry they will not break up; and underdrainage helps to keep them dry. It is the universal observation that tiled roads in low places dry out sooner than untiled roads on high land; and the tiled roads do not get so bad as those not tiled. All roads, except those on pure sand, can be materially improved by tile drainage.

Unless the soil is very retentive, it will be sufficient to lay a single line of farm tile under one of the side ditches. The deeper the tile the better, but it should not be less than 3 or 3½ feet below the road surface. The tile should be carefully laid to grade, and should not be less than 3 or 4 inches in internal diameter. If the

soil is very retentive a line of tile under each side ditch may be necessary; but more than this is money wasted. Some writers advocate one or more lines of tile near the surface under the traveled way. They are invited to try the experiment and report the result. If laid as indicated, the tiles will probably be crushed by the wheels; and even if they are not crushed, it is probable that little or no water will reach them; and it is certain that their effect will be wholly inappreciable. They would be practically as effective if laid on the top of the fence.

**SIDE DITCHES.** The side ditches are to receive the water from the surface of the traveled way, and should carry it rapidly and entirely away from the roadside. They are useful, also, to intercept and carry off the water that would otherwise flow from the side hills upon the road. Ordinarily they need not be deep, and if possible should have a broad, flaring side toward the traveled way. The side ditch should have a free outlet into some stream, so as to carry the water entirely away from the road. No good road can be obtained with side ditches that hold the water until it evaporates. Much alleged road work is a positive damage for this reason. Piling up the earth in the middle of the road is perhaps in itself well enough, but leaving undrained holes in the side of a road probably more than counterbalances the benefits of the embankment. A road between long artificial ponds is always inferior and is often impassable. It is cheaper and better to make a lower embankment, and to drain thoroughly the holes at the side of the roads. Often the public funds can be more wisely used in making ditches in adjoining private lands than in making ponds at the roadside in an attempt to improve the road by raising the surface.

**SURFACE DRAINAGE.** The surface drainage of the traveled portion of the road is fully as important as its under-drainage, and is provided for by making the surface crowning, and keeping it smooth, so that it will quickly shed the water into the side ditch.

#### MAINTENANCE OF EARTH ROADS.

Of all matters relating to roads, both city streets and rural highways, the maintenance is most in need of improvement or reform. Probably the maintenance of city pavements is not one whit better than that of the country earth roads, considering the conditions and the original cost in both cases. Maintenance is important with any road, since no style of construction is sufficiently permanent to admit of the road's being left to take care of itself. Whether built of earth or stone, it will eventually wear into ruts and holes, the time depending upon the quality of the material, the form of construction, and the amount of the traffic. When ruts or holes have been formed, the deterioration of the road will proceed rapidly unless repairs are promptly made.

Until the suburban and earth roads are maintained in reasonable good condition, it is folly even to talk of constructing high-priced permanently-hard roads. Unless a system of administration can be established and maintained which will keep the earth roads in reasonably good condition, it will be unwise to commit it to the care of a higher-priced and more delicate construction.

The prime necessity in the maintenance of an earth road is to get rid of the water as quickly and as fully as possible. The secret of success in maintenance is to keep the surface smooth and the side ditches open. If the surface of the roadway is properly formed and kept smooth, the rain will be shed into the side ditches and do comparatively little harm; but if the water remains upon the surface, it will be absorbed and convert the road into mud. If all the ruts, depressions and mud holes are not filled as soon as they appear, they will retain the water, to be removed only by slowly evaporating; and each passing wheel or hoof will help to destroy the road.

In the winter there frequently comes times when the road is full of holes and ruts, while the surface soil is dry and mellow. This condition occurs most frequently when the ground below the surface is frozen. If at this time a harrow is run over the road, it will fill up the ruts and holes, and leave the surface smooth. This improves the road for present travel, and also gives a smooth surface which will greatly decrease the deterioration of the road by subsequent rains. The labor required is not great, since a 12-foot harrow can be used, and then a single round is sufficient. The work comes at a time of the year when the farmer's time is not usually very valuable, and hence the expense is small. A railroad rail 14 or 16 feet long or a heavy stick of timber shod with iron and drawn by four horses is also suitable for this purpose. One round trip is usually sufficient for any road.

In the early spring just after the frost goes out of the ground, earth roads are usually full of deep ruts. At this time the roads can be greatly improved by running over them that tool called indifferently "road machine," "road grader," "road plane" or "road leveler." The object is simply to cut off the ridges and fill up the ruts, and thus "break the way" for travel. There are many good road machines on the market, all of which are most excellent for certain kinds of work to be referred to presently, but most of which are too heavy and too elaborate to fit the conditions just described.

In the late spring after the ground has settled, the roads should be prepared for summer travel by being shaped up with the "road machine" or "road grader." When this work is to be done, the ground is comparatively dry, and consequently the heavier road scraper is required and

can be handled on the roads. It is somewhat unfortunate that this tool is ordinarily called a road grader, since the name has possibly led to a misconception as to an important use of the machine. As an instrument of road construction, this machine is used to give a crown to the road; but as an instrument of maintenance, it should be used only to smooth the surface and restore the original crown. Apparently some operators assume that the machine is not to be used except to increase the crown of the road. Employed in this way, the crown is made too great, and a big ridge of loose earth is left in the middle of the road, which consolidates only slowly and which is likely to be washed into the side ditches to make trouble there.

In the summer when the roads get roughed up, they can be materially improved at small expense by running over them with a harrow having teeth down quite flat. If the roads are a little muddy, this treatment will make them dry faster, and also make them much more pleasant to use after they have dried.

#### New York State Aid in 1902.

By John B. Uhle, President of the Highway Alliance.

In the same year that State aid for construction was offered to the counties and towns by the Higbie-Armstrong law, the towns which had been allowed since 1873 to repair their highways by hired labor, were thereafter rewarded for adopting the so-called money system by a donation from the State for maintenance, one-fourth of the amount of tax for road repairs during the preceding year. This amount is now one-half by a law signed by the Governor a few days ago. The payments to the towns have not been large; in 1898, the State aid to towns in eight counties amounted to \$34,517.73; in 1899, in fourteen counties, \$53,807.55; in 1900, in twenty-one counties, \$67,655.84; and in 1901, in twenty-four counties, \$90,460.16—about one town in eight in the whole State receiving State aid for maintenance.

As this donation is made only to towns which have adopted the money system, the number of towns accepting this aid is a test of the local feeling about business methods in caring for the highways. Still, without naming the towns, these only are the counties which include towns receiving State aid for maintenance: Albany, Chautauqua, Chenango, Columbia, Cortland, Dutchess, Erie, Essex, Franklin, Greene, Herkimer, Madison, Oneida, Onondaga, Ontario, Orange, Otsego, Rensselaer, Rockland, Saratoga, Suffolk, Tompkins, Ulster and Westchester, 24 out of 56, excluding the counties in New York City as having no towns, and Nassau as too recently organized to be fairly counted.



Chapter 115 of the Laws of 1898, commonly known as the Higbie-Armstrong law, is the only provision for State aid in construction. The amount of State aid is one-half of the cost of rebuilding a highway, and yet the results so far are 59 miles finished and 109 miles under construction, or 168 miles out of not less than 5,000 miles of road actually needing reconstruction. The total highway mileage of the State is not known, but is supposed to be 100,000, so that about one and a half per centum will be rebuilt by next winter. About 250 miles additional are awaiting State aid; for it must not be forgotten that there is no promise of State aid for construction as there is for maintenance. Every year the legislature must be petitioned and besought for an appropriation; each year the sum appropriated is larger; events cannot continue in this manner, and it would seem the part of wisdom once for all to provide for the improvement of the roads already petitioned for and then reconstruct the principal roads with the proceeds of a State loan, at a low rate of interest and with an extended period of payment to diminish the annual appropriation to the sinking fund. For this year, the legislature already offers \$600,000 for State aid for rebuilding roads, a sum which will secure the reconstruction of forty-one roads in fifteen counties, with an aggregate mileage of 146 and 53-100 miles. Increased to \$750,000, fifty-two roads in sixteen counties, aggregating 177 and 84-100 miles. There seems little probability of the appropriation exceeding this sum, and there will, therefore, remain about seventy-five miles of road which cannot be improved this year. Unfortunately, these seventy-five miles of road include those which would complete the hundred miles of good roads from White Plains around to Yonkers, through the most interesting portions of Westchester County. As those who would use these improved roads have not made any individual efforts for their improvement, there is probably enough popular indifference to justify the legislature in refusing to appropriate the larger sum necessary. No person who has failed to make a personal effort by at least writing one letter to a member of the legislature, has any ground whatever for complaining.

### The Farmer and Good Roads.\*

The question of good roads has been agitated for ten or fifteen years past from the point of view of the bicyclist, the point of view of those who wanted to drive a coach with a four-in-hand through the State, the point of view of those who own automobiles; but not until State Engineer Bond instituted annual conventions at Albany, asking the different counties to send delegates from their respective boards of supervisors and highway com-

missioners, has the question of good roads been intelligently discussed from the point of view of the farmer. It is all well enough to claim the credit of being first in the field of road agitation, but no real progress in road development can be made until you can put back of the entire question the consent of the farmer to accept any plan of improvement which is proposed. To bring this proposition out more clearly, let me sketch for you the magnitude of the question in its relation to the farmer, the road user, and the taxpayer.

#### TOWN GOVERNMENT.

The State of New York has 61 counties. These counties are again divided, for the purpose of local government, into townships, and the township is governed by the town board, consisting of the supervisor, the town clerk, the highway commissioner and two or more justices of the peace. These men are elected once in two years by popular vote in the town, and closely represent the feeling throughout the entire town for progress or parsimony in local development. The town government is close to the wish and will of the people. For more than one hundred years our present highway law has provided that the tax for the maintenance of the highways should be payable in labor. In the city the density of population permits streets to be paved with granite or asphalt without creating an excessive burden on the property owners. In the country it is no trick for a man to be rich enough to own a mile or two miles of farm lands fronting on highways, but on account of the scarcity of population it would be a burden to ask him to pay \$50 a year toward the maintenance of his two miles of highway, and if compelled to do so it would drive the farmers into bankruptcy. At the beginning of the century there was barely commerce enough to enable the nation and the State to raise by taxation money for the support of the national and State governments, and at this period of our history it was proper that the tax for the maintenance and improvement of the highways should be made payable in labor, that which a man had to pay with, he should pay with. This method of paying the road tax has prevailed for over a century, and is it to be wondered at that a method of paying taxes so ancient and so honorable in its origin should have quietly drifted into a system which has proved worse than useless, and that without occasioning any particular criticism on the part of the public.

In order to show just what I mean by the foregoing statements, I want to contrast for you the relationship between our canals and our highways.

\$49,000,000 SPENT ON THE CANAL IN 20 YEARS. AND WHAT IS THERE TO SHOW FOR IT?

The Erie Canal, 381 miles in length, was completed in 1825, at a cost to construct of \$52,540,800. During the last 20 years

the State has expended on the Erie Canal and its feeders, for maintenance and enlargement, the sum of \$49,743,777, and by these large expenditures the State of New York has been enabled to build within her borders the cities of Manhattan, Buffalo, Syracuse, Utica, Rochester and Albany. The growth of these cities is largely attributable to the building of the Erie Canal, and these cities in return pay 70% of the entire State tax. The maintenance of the Erie Canal at public expense enables the State of New York to regulate and reduce during the eight months of the year that the canal is open, the freight charges made by the railroads passing through the State of New York.

\$50,000,000 SPENT ON THE HIGHWAYS IN 20 YEARS. AND WHAT IS THERE TO SHOW FOR IT?

The State of New York has in round numbers 50,000 square miles of area. Its highways average two miles to every one square mile of area, the total mileage of highways approximating 100,000 miles. During the past 20 years the number of highways in the State has not been increased to any large extent, and the figures given below are approximately correct. In Governor Flower's message to the Legislature in 1893, from information received from nearly every county, Governor Flower showed that the highways in the State of New York were maintained by an assessed labor tax of 2,000,000 of days per annum to care for them from March 1st to November 1st. This labor tax has been expended under the direction of the highway commissioners and overseers in each town. A day's labor, during the last 20 years, has never been worth less than one dollar. The highway commissioners and overseers have, in the past 20 years, had the expenditure on 100,000 miles of highways, of the equivalent of \$40,000,000, valuing a day's labor at \$1.00 a day, and valuing it at \$1.50 a day they have expended the equivalent of \$60,000,000 upon the highways.

The expenditure of this large volume of day's labor in the care of the highways has never caused any such criticism on the part of the public as the expenditure of a similar amount on the canal has caused, neither has the tremendous waste and extravagance been appreciated. After 20 years of expenditure on the highways of the equivalent of \$50,000,000, the highway commissioners and overseers have nothing to show as a result of their work and have not cheapened the cost of transportation by improved highways one cent per ton per mile.

#### LEGISLATION.

And I want to say right here that at the Third Annual Convention in the interest of highway improvement, held in Albany, on the 28th and 29th of January last, at which were present 300 delegates, being supervisors and highway commissioners from 41 counties in the State,

\*Extracts from the address of W. Pierrepont White at the annual dinner of the A. C. A., March 7, 1902.

these men, the representatives of their towns, passed resolutions asking that the labor tax be abolished and that a money tax be substituted in each town, and that the State contribute to each town 25% State aid up to one-tenth of one per cent. of the assessed valuation of the town. The farmers are back of this movement. And I want to say, too, that at this same convention these same 300 delegates asked unanimously that legislation be prepared to raise \$20,000,000 by bonding the State to improve the State's highways. The farmers are back of this movement. And I want to say, too, that these same delegates passed resolutions asking for legislation which would make wide tires compulsory throughout the entire State after 1905.

#### NEW YORK STATE HIGHWAYS.

The proposition in regard to highways before the State of New York is as follows: The State of New York, as I have said, has an area of approximately 50,000 square miles. It has on an average two miles of highways for each one square mile of area, which would give an approximate mileage of highways for the State of 100,000 miles. Chapter 115 of the Laws of 1898, provides for the improvement of main highways only, their cost of construction to be paid 50% by the State, 35% by the counties and 15% by the towns benefited. These main highways constitute about 10% of the entire State mileage. The State of Massachusetts is improving 10% of its highways mileage. The proposition in front of the State of New York, therefore, is the laying out of an intelligent plan for the improvement of 10,000 miles of its highways in such a manner as to not only constitute main highways of travel through the State, but to so develop easy access to the 21,961,562 acres of farm land as to enable the farm owners to bring such part of their 12,000,000 tons of annual farm products which they raise directly to the canals, or to the railroads in order to reach their markets.

#### COMMERCIAL SUPREMACY.

The commercial supremacy of New York depends upon its being able to maintain the cheapest rate of transportation across the Continent, and at the same time take care of the interests of the inhabitants of this State. We can reduce the price of transportation by increasing the carrying capacity of the Erie Canal, and it directly benefits New York and Buffalo. We can decrease the price of transportation of farm products by building a system of State highways which will cover 10,000 miles of highway in the State, leaving 90,000 miles of highway to be cared for by the local authorities in each town, and it directly benefits every county. In order to cheapen transportation for the farmer we must improve 10,000 miles of highway, only 2,000 miles more than the 8,000 miles of steam railroad in the State. The development of steam railroads and trolley roads has

given rapid transit to the cities and to the State, the development of 10,000 miles of country highways will give rapid transit to the rural districts and will unite the entire population of the State of New York on the proposition of maintaining the commercial supremacy of the State of New York by the expenditure of whatever is necessary in order to maintain our canals and our highways.

#### Steel Highways.\*

One drawback to road improvement as it is generally understood, that is macadamizing, is that it is a crude and unsatisfactory improvement at best; it shows no advance in method in the past 2,000 years; and when compared with the high development of railroads it discredits the ingenuity of a progressive age, and the talent that has been applied to the subject.

From a logical standpoint there is no more sense in running a wagon over stones than in doing the same with a locomotive. But railroads are a private concern and have had the advantage of a private interest and private initiative, while roads are a public concern and a public neglect. The same means of "smoothing the way" is available to both, but for roads it has scarcely been considered.

The reasonableness of metal tracks for wagons has, however, forced itself into view from time to time; and, some fifty years ago in Glasgow, Scotland, plates of iron were laid down for wheel ways, following the idea of many roads in Italy and elsewhere made of stone slabs laid end to end.

I had strong hopes of introducing steel trackways for trucks in certain streets of this city a dozen years ago, having made provision against the slipping of horses; and I had the strong support of Mayor Hewitt and President Van Rensselaer of the Board of Aldermen, but the majority of the Board had other views.

Subsequently, when in charge of the Government Bureau for Roads at Washington, I constantly advocated the testing of this improvement at the public expense, and my successor was enabled to lay several experimental sections of steel trackway, although he was at a disadvantage in not having means to pay for the rolls needed to produce the desired shapes of rail.

These experiments fully established the advantages of the system, and they were confirmed by private trials.

But, strange to say, we have to go to Spain for the most decisive progress in this direction. A consular report published in the Railroad Gazette of Nov. 24, 1899, says:

"The road between Valencia and Grao is two miles in length, and an average

\*Extracts from the remarks of General Roy Stone before the Automobile Club of America, March 4, 1902.

of 3,200 vehicles pass over it daily. Until 1892 it was constructed of flint stone. The annual cost of keeping it in repair was about \$5,470. The construction of a steel roadway was determined on, and the annual cost of keeping in repair the central belt of road thus relieved from heavy traffic—which proceeds over the steel rails—is now about \$380. The total cost of the road laid was \$9,506. The expense in detail was: Steel, \$6,890; transportation and laying steel, \$507; binding-stone construction, \$2,109; total, \$9,506. The rails, during the seven years they have been in position, have not required repairing. At each side of the rail are layers of binding stones, the paved road being higher than the face of the rails. A toll of (about) eight-tenths of a cent is charged each vehicle passing over this roadway."

#### The Knickerbocker Model 2 Gasoline Car.

In Fig. 5 is shown the latest model of Knickerbocker gasoline car, built by the Ward Leonard Electric Co., Bronxville, N. Y. It is equipped with three changes of speed ahead and one reverse, and has a maximum speed of 25 miles an hour. It has a 66-inch wheel base, gauge 47 inches, and weighs 1,000 pounds. Gravity circulation is depended on, there being no pump. On the high speed the transmission is direct from the motor to the bevel pinion driving on the differential, and there are no idle gears in mesh. The gasoline supply is stated to last from 125 to 150 miles. The makers say that in a recent test over ordinary roads in their vicinity, the car was run a little over 125 miles on 4.6 gallons of gasoline, the duration of the run being six and one-half hours. This was the full capacity of the tank, and the run was made, the makers state, with no stop for any cause. As the photograph shows, the car has a tonneau body and carries four passengers. It is equipped with Midgley tubular wheels.

#### The Prescott Steam Touring Car.

A new steam touring car, arranged for two or four passengers, is shown in Fig. 6. Its wheel base, 68 inches, is a little longer than that of the regular model of the manufacturers, the Prescott Automobile Mfg. Co., 99 Chambers St., New York, and the wheels are likewise extra strong and fitted with 2½ or 3-inch tires, as ordered. Two double-acting brakes act on the rear hubs, thus minimizing the danger of skidding and removing the braking strain from the differential. A roller chain is used, and the engine, though shown open in the illustration, is regularly encased. The boiler is 16 inches in diameter, of the usual design, but with an automatic regulator controlling the feed. The burner is arranged to be started by a small alcohol lamp, which the makers consider much more convenient and also safer than gasoline. The total weight with tanks filled is stated to be 1,000 pounds.



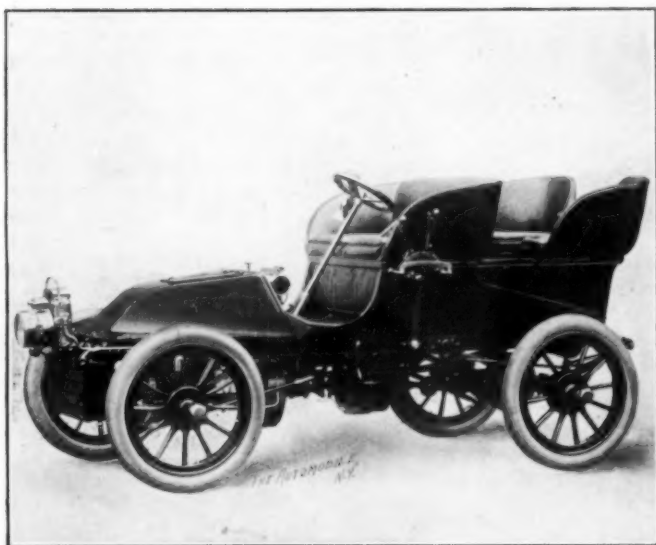


FIG. 1. THE TOLEDO 16-HP. GASOLINE CAR.

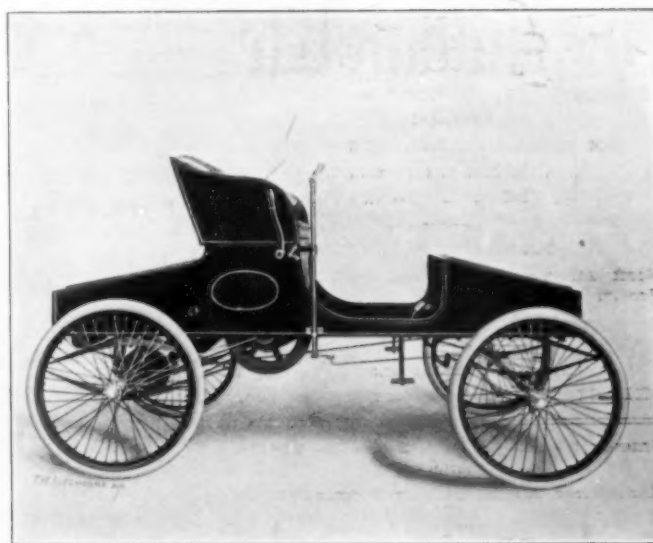


FIG. 2. THE "BUFFALO SR." GASOLINE RUNABOUT.



FIG. 3. THE WAVERLEY ELECTRIC SURREY.



FIG. 4. THE MURRAY GASOLINE MOTOR CAR.

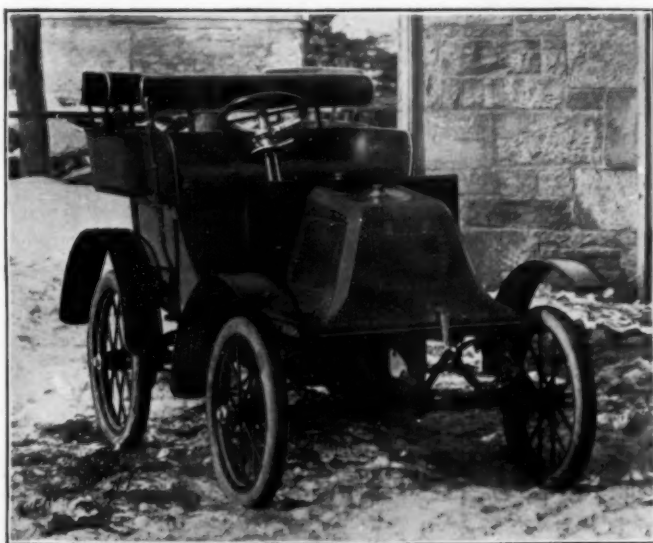


FIG. 5. THE MODEL 2 "KNICKERBOCKER" CAR.



FIG. 6. THE PRESCOTT STEAM TOURING CAR.

### NEW STYLES OF AUTOMOBILES.

(For descriptions of Figs. 1 to 4, see pp. 110 to 112.)

# The Automobile

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Owing to the unusual pressure on our columns this month, we regret to have been compelled to leave out the second installment of Dr. Paul Norwood's article, "Faulty Steaming." It will, however, appear in our next issue.

## Our Good Roads Number.

It gratifies us to be able to present to our readers this month what we believe to be a more comprehensive and practical discussion of the good roads question than has yet appeared in automobile journalism. It is easy enough to talk about good roads, and the theme has been a favorite one with post-prandial orators and impractical agitators for many years. The benefits of good roads can no more be denied than the benefits of the railroad, but the relation of value received to money expended, and the possibility of the balance being on the wrong side of the ledger, are just as existent with the one as with the other; while the fact that highways are paid for by the community and not by private companies organized to do business in a businesslike way opens the door wide to the advocacy of all sorts of paternalistic schemes for state or national aid in constructing roads whose benefits would be in a vanishing ratio to the outlays involved.

The weakness of so many of these arguments is effectively exposed in the first article by Professor Baker; and the wide variation in local conditions to be met, a point which is seldom appreciated by good roads enthusiasts who are not also civil engineers, is clearly indicated as well. The friends of improved highways cannot too clearly remember that the farmer who must pay for the improvement is the final arbitrator, without whose approval their finest speeches and most impressive figures will go for naught. It is for this reason that we have devoted so much space to articles treating of substitutes for stone roads, and especially of what can be done to redeem the dirt road from disrepute. That a great deal can be done by a judicious combination of crowning or "turnpiking" and draining cannot be disputed; and although such roads can never be good in very wet weather, nevertheless, during those months of the year when they are most traveled and when the farmer most needs them to move his produce, they can be made to answer the purpose very well.

On the other hand, there is an advantage in having roads open to traffic all the year which is not merely pecuniary, but moral as well. This is because, next to the railroad, improved highways are the most potent factor of civilization in bringing the country into touch with the city and the city in touch with the country, to the incalculable benefit of both. The inevitable stagnation of isolated humanity, amounting to a living death of

all the higher faculties, is without question the real reason for the steady drift from country to city; and it is probably the realizing sense of what this stagnation means that, perhaps unperceived by them, has been the moving force with the most earnest of good roads advocates in the past. They have seen that the benefits of good roads far transcend those which have been directly convertible into cash; but they have been compelled to address themselves to the only motive which would at the time be understood by the prospective beneficiaries—the betterment of their pockets. Hence have arisen both the extravagant cloud building on the one hand and the stolid, if not contemptuous, indifference to moving appeal which, little to the furtherance of these advance agents of civilization, have too often characterized the propaganda of good roads.

In showing what has actually been done under existing conditions, and in pointing the way to achievement of the further practical results, we believe that the articles in the preceding pages are well worthy the careful study of all our readers.

## Automobile Progress at the Chicago Show.

If the exhibit at Madison Square Garden last November marked some radical advances in the design of gasoline vehicles, the show held in Chicago last month will equally be identified with the first radical departure from primitive lines in steam carriage design. It has for some time been evident that the American gasoline vehicle was destined ere long to fall into line with European practice in the adoption of a long wheel base, reachless running gear, low center of gravity, approximately equal distribution of weight between the axles, and wood wheels for everything above the runabout class; and it has been equally evident, since an automobile is an automobile, that the builders of steam vehicles would find themselves compelled to follow the same lead, or else resign the touring field altogether and confine themselves to runabouts. The change which had its inception in the new touring cars shown in Chicago was the only alternative to stagnation in that line.

We have for some time been convinced that another innovation would ultimately be necessary to retain for the steam touring car a popularity commensurate with that enjoyed by the lighter vehicles of that motive power, namely, the substitution of kerosene for gasoline as fuel. The high powers and long distances now in vogue make the disparity in fuel cost between the steam engine and explosion motor too considerable to be ignored, when the former is of the wasteful type commonly in use, and when gasoline is the



fuel in both cases. It seems inevitable that this disparity will be still further accentuated, at no distant day, by a permanent increase in the price of gasoline. In spite of the difficulties of burning it under a boiler which must be so irregularly heated as that of an automobile, we are compelled to regard kerosene as a logical fuel for this case; and, while not committing ourselves, in advance of public demonstrations, to an opinion regarding the practicability of the kerosene-fired machine, which was so prominent at the show, we may yet permit ourselves to regard with much satisfaction the fact that its makers considered themselves warranted in giving it that measure of publicity.

In the matter of running gear and weight distribution, the prevailing tendency was manifested in a number of cases, not only in touring cars, but in runabouts as well, and it is safe to predict that within another year the short, light buggy style of steam carriage, with the front wheels so lightly loaded that they cannot be kept on the ground when the throttle is wide open, will be a thing of the past.

Among gasoline vehicles the principal progress was in the runabout class. It is evident that the type of machine embodying a single cylinder horizontal motor under the seat, planetary speed-changing gear, and direct-transmission through a chain on the high gear, is finding great favor. Whether it will ultimately stand as the American type of light runabout it is perhaps too early to predict. As small wheels are inadmissible and the ratio between the engine and axle speed cannot transcend certain limits with direct transmission, the engine must necessarily be slow running. This is further necessitated by the horizontal position of the engine, which would cause intolerable vibration at high speed unless it had two cylinders. It seems not impossible that this type of machine will eventually be found in another intermediate class, for suburban use and short tours, and that the town runabout proper will be a machine probably 25 per cent. lighter and correspondingly easier to handle in crowded situations. To secure this reduction of weight, a high-speed motor would be the first requisite; and to utilize such a motor a low-priced and efficient transmission gear offers itself as an interesting problem for designers.

#### How Are Improved Roads Maintained?

While so much is being said and done in behalf of the construction of new stone roads, it seems an extraordinary omission that so little should be done, in some states, to insure the proper maintenance of these roads after they are built. In New York State, despite the fact that the

State is contributing largely toward the expense of both building and maintaining improved roads, there is no provision whatever for State supervision of these roads after they are built. The local supervisors are elective officers, responsible to no one higher than the local politicians, and the State, which is now obligated to contribute one-third toward the maintenance of all improved roads maintained on the cash tax system, in towns asking for such aid, has no control in the matter other than the possibility that the Legislature may, in its judgment or caprice, refuse to appropriate the specified sums. While we would not insinuate that this fact was at the bottom of the enthusiastic vote of the recent Supervisors' Convention to advocate doubling the \$10,000,000 appropriation for good roads recommended by State Engineer Bond, it can hardly be disputed that the present anomalous situation has a good deal to do with the reluctance of the Legislature and the Governor to sanction large cash expenditures in this direction. The \$20,000,000 appropriation will be an excellent thing when we get it, even though at the present time it will require an amendment to the State Constitution to render it practicable, but by all means, when that law is passed, let there be another law to insure that this large sum will be wisely expended and where the good to result from it will be permanent.

As Professor Baker truly says: "The chief defect in the construction and maintenance of American highways is the lack of intelligence and effective supervision," and again, "Until the suburban and earth roads are maintained in reasonably good condition, it is folly even to talk of constructing high-priced permanently hard roads. Unless a system of administration can be established and maintained which will keep the earth roads in reasonably good condition, it will be unwise to commit it to the care of a higher-priced and more delicate construction."

#### The Cocks Automobile Bill.

As this issue goes to press, news comes from Albany that the amended Cocks automobile bill, after passing the New York Assembly, has received the Governor's signature. The practical working of this bill will be watched with considerable interest. It can hardly fail to result in a better condition of affairs than existed under the Doughty law, since it at least can be enforced without an excessive amount of red tape, and contains penalties worth the trouble of enforcing; at the same time, the new speed limit of twenty miles is a far more reasonable one than the old fifteen-mile limit, and is probably nearly or quite high enough for all conditions where an automobile would encounter other traffic. The fact that this limit is permissible anywhere outside of cities or incorporated villages makes the

law perhaps unnecessarily liberal, since, if we are not mistaken, there are very many villages in New York state, through which a speed of twenty miles would be of questionable safety, which are not incorporated at all.

On the other hand, there is the old difficulty of proving the speed at which the machine was going; and for some time to come we may anticipate that the estimates of policemen and witnesses will almost invariably err in the direction of adding to rather than diminishing the actual speed.

Mr. Herbert L. Towle, who has been on the editorial staff of THE AUTOMOBILE the past year and a half, in charge of its technical department, has opened an office at 123 Liberty St., New York, and will make a specialty of gas engine and automobile draughting and designing. Mr. Towle will, however, continue his technical work in connection with this Journal, and will conduct his department with the same impartiality and vigor that has distinguished it heretofore.

#### What New York Roads Really Are.

In a letter to the editor of THE AUTOMOBILE, Mr. Elmer Apperson, whose machine made the best record of any American entry in the New York to Rochester endurance run last Fall, remarks that, according to his experience, the principal difference between up-State New York roads and those of his own State, Indiana, is that "the roads of Indiana are as far ahead of those of New York State as the latter are ahead of the roads of Tennessee and Georgia."

"We can go two hundred miles in any direction," Mr. Apperson adds, "from almost any point in Central Indiana without leaving a good gravel road. The roads of Indiana are practically all made of gravel, which is readily obtainable, and during nine or ten months of the year they are in very good condition."

"As an illustration of the difference between the roads of Indiana and Western Ohio and those of New York, will say that on our trip from Kokomo, Ind., to New York City last September our first day's run was from Kokomo, Ind., to Mansfield, Ohio, a distance of 224 miles, which was our best day's run on the entire trip; and the next best day's run after leaving Mansfield was from Albany, N. Y., to New York City, something like 150 miles, and we worked harder to make this last 150 miles from Albany to New York City than we did on the first day's run of 224 miles from Kokomo, Ind., to Mansfield, Ohio."

"If every state in the Union had such roads as central Indiana and western Ohio automobilists would be a great deal more of a pleasure than it is at the present time."

### New Vehicles at the Chicago Automobile Show.

The automobile show in the Coliseum, Chicago, under the joint auspices of the Chicago Automobile Club and the National Association of Automobile Manufacturers, was a deserved success. In point of business done it undoubtedly surpassed any previous show, and, if the attendance was not as numerous as on some other occasions, this was, from the exhibitors' standpoint, fully compensated for by the fact that those who did visit the show were on business bent and not mere sightseers.

The most striking feature of the show, as regards new vehicles shown there, was the pronounced tendency among steam

tern, with a working pressure of 300 pounds, and superheating its steam to 500 degrees Fahrenheit. The engine is compound, with central valves, and develops 13 HP. It may be changed to work as a simple engine, when it develops 26 HP. The burner is arranged to burn kerosene, and the makers report that its efficiency is even higher than would be expected from the difference in thermal units contained between gasoline and kerosene. Another new feature is the condenser, similar in appearance to the radiating coils of the gasoline machines and similarly placed, though not shown in the illustration. An oil separator is provided, and the makers state that they have obtained an indicated horse power from 21

Another up-to-date newcomer was the Toledo steam touring car, which is shown on the front cover. This machine has an 84-inch wheel base with no underframe. Wood wheels 32 inches in diameter, and  $3\frac{1}{2}$ -inch double-tube tires, take the place of the familiar wire wheels and single-tube tires. The running gear is much like that of a gasoline vehicle and the increase in wheel base is gained chiefly by carrying the rear axle further back, distributing the weight about equally between front and rear. The springs are similar in arrangement to those of the gasoline car of the same company, elsewhere described. The frame is of angle iron and the standard Toledo Loller and engine are used, but the engine



THE CHICAGO AUTOMOBILE SHOW.

vehicle builders to get away from heretofore conventional steam carriage lines, and adopt the running gear, wheel base, and distribution of weight sanctioned by the most up-to-date practice in gasoline vehicle lines. Most revolutionary of all the new steam vehicles was doubtless the heavy touring car of the Milwaukee Automobile Co. This machine is worked out on gasoline vehicle lines almost throughout, having the boiler under a bonnet in front, a gasoline vehicle running gear with wheel steering, and, most unusual of all, three changes of gear ratios. The boiler is of a semi-flash pat-

tern, with a working pressure of 300 pounds, and superheating its steam to 500 degrees Fahrenheit. The engine is compound, with central valves, and develops 13 HP. It may be changed to work as a simple engine, when it develops 26 HP.

The second speed of the gear-changing device is the one intended for ordinary use, the low gear being intended only for extremely bad spots in the road, and the high gear being added at the owner's request for racing. The lowest gear is about 4 to 1, the wheel being 34 inches in diameter; the second gear is  $2\frac{1}{2}$  to 1, and the high gear is  $1\frac{1}{2}$  to 1. An idler in the gear case allows the engine to be turned over without jacking the rear wheels.

is placed behind instead of in front of the boiler. As the boiler no longer has to be elevated above the chain, it is hung very low. Wheel steering is used, and the burner, though it has the usual automatic regulator, may be controlled also from the seat. A single lever controls the throttle and reversing gear.

Two new vehicles shown by the Foster Automobile Mfg. Co., Rochester, N. Y., are shown in Figs. 7 and 8. The light roadster is intended to meet the demand for a steam carriage somewhat lighter than the same company's touring wagon, but withal possessing good speed, and of



stylish design. Its running gear shows the tendency of present construction in the omission of the underframe and the use of semi-elliptic side springs. By the use of straight front and rear axles the reduction in weight due to the above construction is increased. The wheel base is 72 inches, and the center of gravity of the machine is said to be about 12 inches lower than in previous models. The engine, of the regular enclosed self-oiling type, is placed on the left side of the carriage, so that the chain does not interfere with the boiler, and the latter can therefore be hung very low, and a deep burner can be used, thus securing perfect combustion before the gases enter the boiler flues. The gasoline tanks under the front hood are each of five gallons capacity and of seamless steel tested to 400 pounds pressure. Either or both can be filled at discretion, and one can be used for air pressure alone if desired. The air pressure is maintained by the engine, and the

pump in addition. The air pressure may be maintained either by the engine or by a steam air pump. The gasoline is vaporized in a seamless steel retort placed over the fire, and is consumed in a two-part burner with a pilot light of the partitioned type. An automatic regulator is provided, and in addition the driver may reduce the fire at will.

Among the newcomers in the gasoline runabout class, the Rambler carriage, built by Thos. B. Jeffery & Co., Kenosha, Wis., was one of the most noticeable. This machine is properly in an intermediate class, it weighing about 900 pounds complete, and having a single cylinder of  $4\frac{1}{2}$  inches bore by 6 inches stroke, stated to give a maximum speed of 18 miles an hour. In the general arrangement, this machine follows lines made popular by several predecessors. It has a planetary speed-changing gear directly coupled to the engine shaft, and on the high speed the transmission is direct from this to the

The 16-HP. gasoline touring car, which the International Motor Car Co. showed for the first time at Chicago, and which is to take the place of the "Hydrocar" now withdrawn from the market, is shown in Fig. 1, p. 107. The general disposition of the machinery follows the approved lines of French practice, now being largely adopted in this country, but with some original details. The engine has three cylinders, of  $4\frac{1}{4}$  inches bore and  $5\frac{1}{4}$  inches stroke. Both inlet and exhaust valves are mechanically operated, the makers claiming to have found that the cylinders thereby are made to receive a larger supply of mixture; while the familiar trouble of sticking inlet valves is, of course, removed. The speed-changing gear in the machines shown in the planetary type, with transmission through a short universally-jointed shaft to bevel gears on the live rear axle; but the makers state that sliding gears and a transverse countershaft with two-chain drive may be substituted.

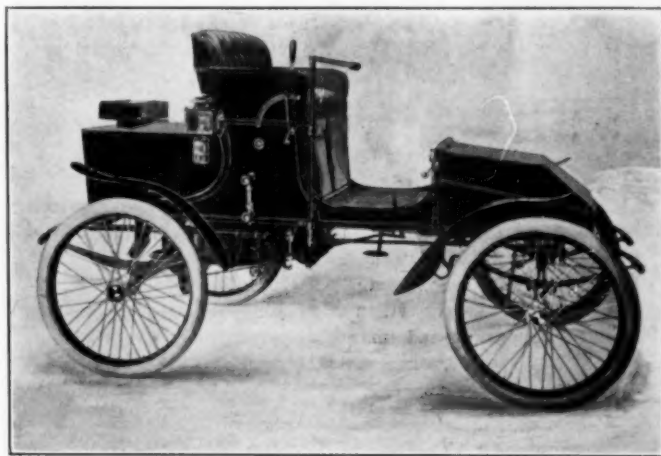


FIG. 7. THE FOSTER LIGHT ROADSTER.

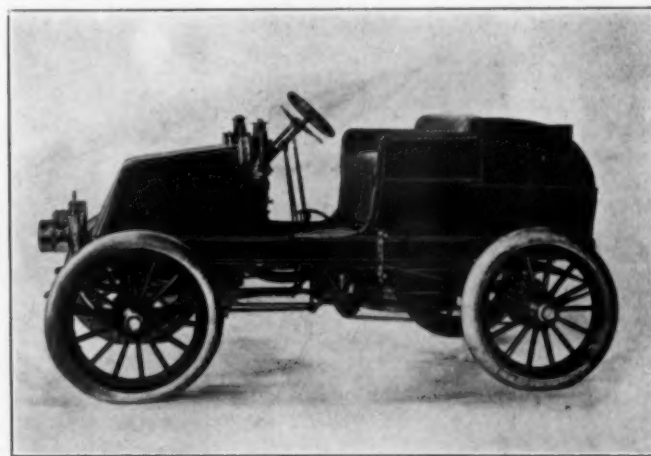


FIG. 8. THE FOSTER SPEED WAGON.

fire is controlled automatically and may be regulated by the driver as well. The brake is double-acting, and the water capacity is 25 gallons.

The speed wagon shown in Fig. 8 is the largest of a number of experimental machines built by the Foster Automobile Mfg. Co. While not exhibited as a commercial machine, it still attracted considerable interest at the show, and differs in a number of respects from the usual types. It weighs 2,800 pounds, and is fitted with a 15-HP. engine and boiler. The makers state that it has attained a speed of 45 miles per hour on a straight-away course. The boiler is placed in the center of the vehicle, and, being 24 inches in diameter, it takes up with its outside lagging nearly the entire width of the body. The engine, under the front hood, drives a transverse countershaft just in front of the boiler, and two side chains run from sprocket pinions on this shaft to the rear wheels. There are two engine pumps, either of which will supply the boiler alone, and an auxiliary steam water

live rear axle. The axles are claimed to be of exceptional size and strength, and the rear axle is of a construction which makes good use of the material in it. The differential is close to one spring block bearing, and a large shell enclosing the differential and sprocket wheel gives ample rigidity at this vital point. As the illustration on the front cover shows, the rear elliptic springs are swiveled to the frame just below the body, so that lengthening the distance rod, or the rise and fall of the axle when riding, can cause no strain on the springs.

Ignition is by jump spark with dry batteries, and the lead may be varied by the operator. A special device automatically retards the spark when the starting crank is turned, so that there is no danger of a back kick from the operator's forgetting this point. The battery switch and gasoline feed cock are connected, so that one operation closes the one and opens the other. Gravity circulation is used, and a bank of cooling tubes is provided under the front of the carriage.

The latter system has the advantage of allowing the use of three instead of two forward speeds. The circulation is maintained by a centrifugal pump with friction drive, and jump spark ignition is employed, with lead of the spark automatically controlled by a governor. The igniting system is so arranged that the circuit of each cylinder may be tested independently of the others while the motor is running. A friction-driven magneto furnishes current, and a dry-cell battery is provided for starting. A float-feed carbureter completes the motor equipment.

Three brakes are provided, and the lubricating oil is distributed from a sight-feed reservoir on the dash. The wheel base is 84 inches, the over all length 9 feet 4 inches, and the gauge is standard. The wheels are of wood, 32 inches in diameter, with 4-inch G. & J. tires.

The Fournier-Searchmont Automobile Co. showed samples of all their styles, these including two new vehicles which have not heretofore been exhibited, which they call types IV and V. These latter

machines carry the motor in front and have a three-speed transmission gear with direct drive on the high speed to a live rear axle. Type IV is a runabout model with 6-HP. single-cylinder motor and weighing approximately 1,000 pounds. Its wheel base is 70 inches and gauge 48 inches. The larger machine, a tonneau, has a 12-HP. double-cylinder motor and substantially similar transmission gear. It weighs with the tonneau approximately 1,800 pounds, and has a 78-inch wheel base and 51-inch gauge. It is fitted with wood wheels 32 inches in diameter and  $3\frac{1}{2}$ -inch double-tube tires. The small illustration on this page shows the runabout, and the front cover illustration shows the tonneau.

Another new machine which attracted much attention was the Murray motor car, manufactured by the Church Mfg. Co., Adrian, Mich. This machine, which is shown in Fig. 4 p. 107, has a spring arrangement much like that of the Oldsmobile and Knoxmobile, but supplemented by a transverse elliptic spring between the front axle and the front end of the body, by which the see-sawing of the latter is measurably reduced. The rear body covering can be easily removed, and the engine and connected parts thereby completely exposed. The power equipment comprises a single-cylinder four-cycle engine,  $4\frac{1}{4}$ -inch bore by  $7\frac{1}{2}$ -inch stroke, with planetary speed-changing gear and direct chain drive.

Two attractive runabout designs were shown by the Buffalo Automobile & Auto-Bi Co., and designated by them the Buffalo Senior and Buffalo Junior, respectively. The former of these is shown in Fig. 2, p. 107. It is equipped with a 6-HP. E. R. Thomas water-cooled motor, and weighs 800 pounds. It has a reachless running gear, with three-quarter elliptic front springs and a 6-foot wheel base. The wheels are 28 inches in diameter, with  $2\frac{3}{4}$ -inch tires. The transmission gives two forward speeds and one reverse, and the equipment includes a Thomas float-feed carbureter and forced circulation with radiating coils. The machine may be equipped with tonneau seats as an extra.

### The New Winton Factory.

The Winton Motor Carriage Co., Cleveland, O., has just gained possession of a twelve-acre tract of land on the west side of the city, on the Lake Shore Railroad. The property is south of Detroit St., paralleling the L. S. & B. L. S. tracks, Berea St. and extending to West Madison Ave. The site possesses superior advantages for manufacturing, and the Winton company will construct immediately a factory, which will be a one-story structure covering nearly the entire portion of the twelve acres. Mr. Winton states that when com-



THE 6-HP. FOURNIER-SEARCHMONT.

pleted, the factory will be one of the largest in Cleveland, and will require the employment of a thousand workmen.

Surrounding the new plant there will be a speeding track over three-quarters of a mile in length. Upon this course it is proposed to build steep grades, gravel pits and every thing necessary for testing a machine before putting it upon the market. The company concluded to build a new factory some time ago, and after considering propositions from several towns and cities, it was decided to remain in Cleveland.

### Road Around Nelson Hill Nearly Completed.

The announcement last November that a road was being constructed by private subscription around Nelson Hill, that *bete noir* of automobilists, just north of Peekskill, N. Y., aroused much interest among automobile tourists in the eastern part of New York State. In response to THE AUTOMOBILE'S request for information regarding the progress made on this road, Mr. William Church Osborn, of 71 Broadway, who is the leading spirit in the enterprise, writes as follows:

"Replying to your favor of March 4th, inquiring about the road around Nelson Hill, I would say that work closed on this road about December 1st, with about 3,000 feet out of the total of 6,070 constructed and about 500 feet surfaced. The remainder of the road is free from blasting or heavy fills such as characterized the 3,000 feet already built, and it should be constructed rapidly on the opening of the season. We will probably begin work about April 1st and complete the construction about June 1st.

"The question of surfacing has been taken up with the State Engineer with a view of obtaining aid in macadamizing the road under the Higbie-Armstrong Act. The lateness of the application, however, makes it doubtful whether the State can grant aid for another year, and we will probably surface a portion of the road immediately with a view to opening it to travel this summer. Whether that surface will be macadam or dirt and whether it will cover the entire road-bed of seventeen feet, or only a portion, will depend on the subscriptions which we receive, but I believe the road will be ready for use early in June. The average grade will be about 3 per cent and the maximum will be 8 per cent for a distance of about 500 feet. The road is built 17 feet wide, and so far is underlaid with several feet of stone for the entire length.

"Yours very truly,

"Wm. Church Osborn."



THE NEW MILWAUKEE STEAM TOURING CAR.



## CLUB NEWS AND VIEWS

### Club Directory.

Albany Automobile Club, F. G. Robinson, Secy., 422 Broadway, Albany, N. Y.

Automobile Club of America, S. M. Butler, Secy., 753 Fifth Ave., New York.

Automobile Club of Baltimore, W. W. Donaldson, Secy., 872 Park Ave., Baltimore, Md.

Automobile Club of Bridgeport, F. W. Boland, Secy., 49 Cannon St., Bridgeport, Conn.

Automobile Club of California, R. R. l'Hommedieu, Secy., San Francisco, Cal.

Automobile Club of Cincinnati, R. H. Cox, Secy., Cincinnati, O.

Automobile Club of Columbus, C. M. Chittenden, Secy., Broad St., Columbus, O.

Automobile Club of Illinois, M. Scott, Secy., 1251 Marquette Bldg., Chicago.

Automobile Club of Hartford, W. G. Cowies, Secy., Hartford, Conn.

Automobile Club of Maine, Henry M. Jones, Secy., Portland, Me.

Automobile Club of New Jersey, W. J. Stewart, Secy., 8 Central Ave., Newark, N. J.

Automobile Club of Rochester, Fredk. Sager, Secy., 66 East Ave., Rochester, N. Y.

Automobile Club of Syracuse, Frederick H. Elliott, Secy., 515 S. A. & K. Building, Syracuse, N. Y.

Automobile Club of Utica, Jas. S. Holmes, Jr., Secy., Huron Building, Utica, N. Y.

Brockton Automobile Club, H. S. Keith, Secy., Brockton, Mass.

Bloomsburg Automobile Club, C. W. Funston, Secy., Bloomsburg, Pa.

Buffalo Automobile Club, Ellicott Evans, Secy., Lenox Hotel, Buffalo, N. Y.

Chicago Automobile Club, H. M. Brinckerhoff, Secy., Monadnock Block, Chicago.

Cleveland Automobile Club, Windsor T. White, Secy., Cleveland, O.

Columbia College Automobile Club, Lewis Lælin, Secy., Columbia College, N. Y.

Dayton Automobile Club, E. Frank Platt, Secy., Dayton, O.

Grand Rapids Automobile Club, Grand Rapids, Mich.

Herkimer Automobile Club, W. I. Taber, Cor. Secy., Herkimer, N. Y.

Houston Automobile Club, Mrs. L. M. Adams, Secy., Binz Bldg., Houston, Tex.

Hudson County Automobile Club, F. Eveland, Secy., Jersey City, N. J.

Indiana Automobile Club, August Habich, Secy., Indianapolis, Ind.

Iowa Automobile Club, W. B. McNutt, Secy., Des Moines, Ia.

Long Island Automobile Club, L. A. Hopkins, Secy., 1190 Fulton St., Brooklyn.

Massachusetts Automobile Club, F. L. D. Rust, Secy., Boylston St., near Exeter, Boston.

National Capital Automobile Club, W. J. Foss, Secy., 819 14th St., N. W., Washington, D. C.

New Bedford Automobile Club, E. G. Watson, Secy., New Bedford, Mass.

North Jersey Automobile Club, E. T. Bell, Jr., Secy., Paterson, N. J.

Pennsylvania Automobile Club, H. J. Johnson, Secy., 138 N. Broad St., Philadelphia, Pa.

Philadelphia Automobile Club, Frank C. Lewin, Secy., Hotel Flanders, Phila., Pa.

Princeton University Automobile Club, Chas. H. Dugro, Secy., Princeton, N. J.

Rhode Island Automobile Club, F. A. Fletcher, Secy., 42 So. Water St., Providence.

San Francisco Automobile Club, B. L. Ryder, Secy., San Francisco, Cal.

Scranton Automobile Club, J. H. Brooks, Secy., Scranton, Pa.

Springfield Automobile Club, Stephen P. Perkins, Secy., Springfield, Mass.

St. Louis Automobile Club, John Ring, Secy., St. Louis, Mo.

Troy Automobile Club, J. S. Thiel, Secy., Troy, N. Y.

Worcester Automobile Club, H. E. Sheiland, Secy., Worcester, Mass.

### The Automobile Club of America.

The annual dinner of the Automobile Club of America was held on March 7 at the Waldorf-Astoria. Nearly 200 were present. The after-dinner speakers included men holding high official and public positions, and their speeches were devoted almost exclusively to the subject of good roads.

On February 25 Mr. Rollin H. White delivered a lecture before the Automobile Club of America in New York on the White steam generator. The lecture was illustrated with lantern slides.

The A. C. A. is arranging extensive club meetings, with a number of suburban clubs, among them the Tenatquilt Corinthian Lock Club, Bay Shore, L. I. and the Golf Clubs of Freeport and Rockville Center, also of L. I. They already agreed to extend prejudice to the new members. At Great Neck, L. I., Mr. McMurtry has prepared facilities for charging and repairing vehicles at his country house.

The membership of the Automobile Club of America is rapidly approaching the four-hundred mark. From recent statistics compiled it was shown that over 250 members of the club were owners of automobiles, the number of machines owned by members being about 360, which, including the new carriages ordered, brings the number up to nearly 450.

It is reported that prominent members of the A. C. A. contemplate making a round trip between New York and Philadelphia early in May. It is proposed to make the trip in one day, although not intended as a record run. The object of the trip is to demonstrate with what ease a party of automobilists can breakfast in New York, lunch in Philadelphia, and dine in New York in the same day, using their vehicles for transportation. It is designed to contrast the ease and cheapness of making the performance as compared with the feat recently accomplished by Mr. Alfred Vanderbilt through relays of horses in his four-in-hand coach drive to Philadelphia and return in one day.

The Runs and Tours Committee of the A. C. A. announces the following runs and tours to be held during the spring and summer. The meet for these runs will be held at 58th St., facing east on either side of the way. The other carriages will line up immediately back of it. Carriages will approach by way of Sixth Ave. and no vehicles will be permitted to approach by way of Fifth Ave.

To prevent racing and driving automobiles at an excessive rate of speed, the runs and tours will be paced. In its announcement the committee calls attention to the resolution of the Board of Governors recently adopted, which provided

that should any member of the club pass the pacemaker he shall be suspended, and on a second offense he shall be expelled from the club.

Notices of each run, giving details, will be mailed club members shortly before the run takes place.

April 12.—Staten Island. Leaving at 9.00 a. m., via Jersey City, returning via St. George. Lunch at Tottenville.

April 26.—Long Island Automobile Club Endurance Test.

May 10.—Nyack. Leaving at 9.00 a. m., via Tarrytown, returning via New Jersey side. Lunch at St. George, Nyack.

May 24.—Run on Long Island. Details later.

June 6.—Spring tour to Philadelphia-Atlantic City, three days' run. Leaving at 9.00 a. m.

June 14.—Morris Park. P. m., run to races.

June 21.—Lake Hopatcong, N. J. Two days.

Also several moonlight runs. Dates later.

It has been definitely decided that the next automobile show in the city of New York will be held during the third week in January, 1903, at Madison Square Garden. The show will be given under the auspices of the Automobile Club of America and the National Association of Automobile Manufacturers. The management will be jointly in the hands of the Madison Square Garden Co., the National Association of Automobile Manufacturers and the A. C. A.

### Grand Rapids Automobile Club.

The Grand Rapids Automobile Club, Grand Rapids, Mich., was recently organized by C. B. Judd, J. T. Byrne and W. F. Avery.

### Scranton Automobile Club.

The Scranton Automobile Club has been organized with a good membership. The officers are as follows: President, C. S. Weston; vice-president, A. P. Bedford; secretary and treasurer, J. H. Brooks.

### Houston Automobile Club.

The Houston Automobile Club, the first automobile club in Texas, was organized in Houston last month, through the instrumentality of Mrs. L. M. Adams. The Club has a full membership, and its officers are as follows: President, J. R. Myers; treasurer, D. E. Sturgis; secretary, Mrs. L. M. Adams. Club-rooms have been secured in the Binz Building, and the meetings are to be held every Wednesday afternoon at four o'clock. The club is organized primarily for pleasure, but will wield its influence in the crusade of good

roads. Club runs will be made to surrounding towns, and long-distance racing will be taken up on the plans of the eastern and northern clubs.

#### The Automobile Club of Hartford.

The Automobile Club of Hartford was organized last month. The officers are as follows: President, Leonard D. Fisk; vice-president, Dr. M. M. Johnson; secretary W. G. Cowles; treasurer, Geo. M. Brown. A communication to THE AUTOMOBILE from Secretary Cowles states that invitations have been sent out and applications for membership are now coming in very satisfactorily. Permanent quarters will be established soon. There are about one hundred private automobiles owned in the city, and Mr. Cowles states that the prospects are that before the end of the season there will be double that number. The interest is unusually great, and the club has every prospect of being prosperous and doing most excellent work. By-laws and constitution have been adopted, the object of the club being clearly stated as follows: "The objects of this Club shall be to promote the uses of the automobile, to better the conditions for its use, and to protect the interests of its users."

#### American Motor League.

The American Motor League held a meeting in Chicago, March 6th, at which the following officers were elected: President, Edwin F. Brown, Chicago; first vice-president, Chas. E. Duryea, Reading, Pa.; second vice-president, W. F. Murray, Detroit; third vice-president, S. W. Merrihew, New York; treasurer, Frederick B. Hill, Boston; secretary, F. A. Egan, New York. At this meeting a committee was also appointed to revise the constitution and provide for a state organization, employing their own attorneys to defend any cases that may come up against automobilists. The purpose of the League, it is announced, is to secure proper legislation and improve the roads throughout the United States. The next meeting of the League will be held in New York City in January, 1903.

#### The A. C. A. One Hundred Mile Endurance Run.

The projected non-stop or endurance run under the auspices of the Automobile Club of America is announced to take place on Decoration Day, May 30. The start will be made at eight o'clock from the club house at Fifth Ave. and 58th St., New York City. The turning point is fifty miles from New York, at Southport, near Bridgeport, and the same route is retraced on the return. The road will be marked by yellow arrows.

[Owing to the unusual pressure on our columns this month we are compelled to omit the rules and regulations until next issue, when they will be given in detail.—Ed.]

#### The Cocks Bill Becomes a Law.

The Cocks bill, which recently passed both branches of the New York State Legislature, was signed by Governor Odell March 28. The measure as signed is as follows:

A person who drives or operates an automobile or motor vehicle, whether the motive power of the same be electricity, steam, gasoline or other source of energy, upon any plank road, turnpike or public highway within any city or incorporated village, at a greater rate of speed than is permitted by the ordinance of a city, or upon any plank road, turnpike or public highway outside of a city or incorporated village at a greater rate of speed than twenty miles per hour, or upon any bridge at a greater rate of speed than four miles per hour, is guilty of a misdemeanor, and shall be fined for the first offence not exceeding the sum of \$50, and for the second offence not exceeding \$50, or by imprisonment for a term not exceeding six months or both.

#### An Amendment to the L. I. A. C. Endurance Contest Rules.

The Endurance Test Committee of the Long Island Automobile Club has made the following important amendment to the rules for its endurance run to be held April 26:

1st. Under non-penalized stops are included those stops due to tire troubles under the following restrictions: (a) Tires are to receive no attention until they shall have become deflated and it is

#### The Covert Motorette.

In the accompanying cut is shown a new gasoline runabout made by Byron V. Covert & Co., Lockport, N. Y. The weight is stated to be less than 450 pounds, the design of the manufacturers being to meet the demand for a light, simple, yet practical, machine, capable of carrying two passengers at a speed of five to twenty miles an hour.

The running gear is made of heavy gauge seamless steel tubing. All the principal machinery is attached to the frame, and so arranged that the motor and transmission gear can be moved forward or backward to adjust the chains for wear. The body is so designed as to leave ample room in front for the accommodation of packages and tools, while access to the motor, batteries, etc., is obtained by removing the cover from the rear. The controlling levers are at the right of the operator. The longer lever is used for steering, being connected with ball joints to the left steering knuckle arm. The short lever controls both the low and high-speed clutches, and the small lever on top controls the sparking device. Two small levers for controlling the carburetor are placed behind the steering post at the edge of the seat. The transmission gear is furnished with two forward speeds, controlled by one lever. A ratchet crank attached to the outer end of the shaft is used for starting the motor. The motor, of French pattern, is water-cooled, and it



THE COVERT MOTORETTE.

apparent that further running in that condition shall prove destructive to either the car or tire, and (b) one hour shall be allowed as non-penalized time for such repairs; any time consumed in excess of sixty minutes during the entire run shall be subject to full penalty.

2d. Electric vehicles are to be allowed a total of sixty minutes for either recharging or relaying batteries. Any time in excess of a total of sixty minutes during the entire run will be subject to full penalty.

is stated will develop three brake horsepower. A Longuemare carburetor is used in connection with a Dow coil and batteries. The gasoline and water tanks each hold two gallons. It is fitted with ball-bearing wire wheels, clincher tires and Brown-Lipe spur compensating gear.

Mr. E. H. Cox recently resigned from the Electric Vehicle Co. and has accepted a position with the Automobile Company of America in its engineering and sales department.



### Automobiles in the South.

Automobiling in the "Sunny South" is becoming very popular and has taken immense hold in New Orleans, and now one can see at all hours of the day smart, up-to-date vehicles doing their various missions. Those who have purchased automobiles are delighted with the elegant repository just erected by the New Orleans Automobile Co., Ltd., pioneer dealers of the South. It is located in one

not claiming too much, I think, to say that automobiles will be one of the prime factors in reaching this most desirable of all blessings to a community—good roads. We have some lovely parks here and it is a beautiful sight to witness the gayly attired occupants of automobiles as they glide noiselessly through the attractive grounds. Coming back to good roads, it is of record that the first vehicle to run over the good road built by the "Good

date. It is proposed to run these vehicles between Houston and Harrisburg on schedule time.

### The Charron, Girardot & Voigt Co. of America.

The Charron, Girardot & Voigt Co. of America was incorporated last month at Albany, N. Y., with a capital of \$500,000, \$100,000 in preferred and \$400,000 in common stock, all of which has been subscribed. It has been known for some time that the firm of MM. Charron, Girardot & Voigt of France contemplated the manufacture of vehicles in this country, and the formation of the American company is the outcome of the negotiations recently carried on by M. Emile Voigt, Mr. A. Proctor Smith, of Yonkers, N. Y., and Mr. C. R. Mabley, of New York. The plant of the Rome Locomotive Works, Rome, N. Y., will be utilized for the manufacture of the new machines, which will include the latest French models. The works have been fully equipped for the purpose, and a lot of machines are now under way. It is expected to have vehicles ready for delivery by July 1.

Mr. H. Monkhouse, of Rome, who is president of the locomotive works, is also president of the automobile company; Mr. A. Proctor Smith is vice-president and Mr. C. R. Mabley, secretary and treasurer. The business offices of the company are located at 513 Seventh Ave., New York City, which is also the location of the firm of Smith & Mabley. The latter firm will act as general distributing agents for America of both French and American machines. The American-made vehicle will, like its French prototype, be built in one pattern chassis or working body, and fitted with any style of overbody desired. The chassis will weigh 1,700 pounds, and



FIG. 1. AUTOMOBILES IN THE SOUTH.

of the most accessible localities and it is specially constructed for the care and sale of automobiles, experienced men being in constant attendance. The automobile is not only capturing the people of this city, but has extended into the sugar and cotton belt, and many planters are purchasing them, finding it an economy and pleasure to have a vehicle quick at hand to reach distant parts of their plantations and other uses requiring speed. Hot weather, the planters claim, is a serious drawback to the use of fine horses, such as they are accustomed to using, and the automobile they have found is more desirable in every way. The negroes on the plantations say, "smart Yankees came down South and freed them, and now they come down with dem dere mobile things to free the mules."

Accompanying this letter are two automobile views taken in this city, which show a snap shot gathering of some of the lovers of the machine, and the Automobile headquarters.

New Orleans is on the top wave of prosperity. There never was a brighter prospect. Representatives of big capital from the East and West are here looking over the field for investment. Many large deals have gone through recently, and there are many on the "tapis." With prosperity comes good roads, and it is

Roads Association" on its visit here was an automobile. The people in the South, as well as the newspapers, are advocating good roads with all their might, and not without success, as the work of improvement is going on so rapidly that within a

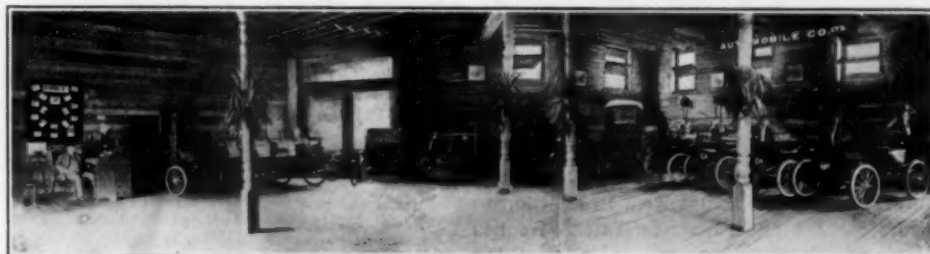


FIG. 2. STORAGE STATION OF THE NEW ORLEANS AUTOMOBILE CO., LTD.

very short time New Orleans can compare with any of the great cities in the country.

New Orleans, March 17, 1902. REX.

### The Houston Automobile Co.

The Houston Automobile Co., of Houston, Tex., has been organized with a capital of \$5,000 for the purpose of operating "Mobile" wagonettes on the Harrisburg road. The organization was effected by Mrs. L. M. Adams, who is president of the company. The first wagonette has been ordered and is to be delivered on an early

the complete vehicle less than 2,000 pounds.

M. Voigt brought to this country a staff of engineers and workmen, who will superintend the construction of the American vehicles.

Mr. E. P. Brinegar, manager of the Locomobile Co. of the Pacific, will come east shortly for the purpose of inspecting the factory of the Locomobile Co. of America, and thereby gain information as regards the manner of manufacturing the vehicle for which his company is agent.

### A Mammoth Automobile Storage and Repair Establishment.

A most important deal was closed last month, whereby the property known as the Central Stables and People's Cold Storage Warehouse, at the corner of Second Ave. and Forty-Seventh St., was purchased by Mr. Joseph H. Hoadley. The building is 300 feet long by 200 feet wide. It is five stories high and is thoroughly fireproof throughout. The property was formerly under the control of E. T. Roche, who will continue as general superintendent. The building is now being overhauled and refitted with special reference to making it a repository for the storage and repair of all makes and kinds of automobiles. To this end the first floor is to be utilized for the storage of vehicles; a machine shop, complete in every detail, has been added, also a paint shop, a carriage shop, upholstery department, and, in fact, no expense is being spared to afford facilities for all repairs necessary for an automobile, even to its practical reconstruction, if need be. The building has three elevators, of 6,000, 8,000 and 12,000 pounds carrying capacity, respectively, to be used in transferring vehicles from one floor to another. An air compressor has been put in, which will be used for compressing air for cleaning upholstery, etc. A full line of necessary supplies will be kept in stock, and the building will be operated day and night, the aim of the management being to make all repairs with the greatest speed possible, a capable corp of mechanics being constantly in attendance. Special attention will be given to the charging and repair of storage batteries.

The power to operate the charging plant and the entire building is furnished from a Diesel oil engine. A reception room for patrons will be located on the ground floor, and a special reception room for ladies is also being fitted up on the same floor. The offices will also be located on the ground floor. It is learned from Mr. Hoadley that all the vehicles purchased by him from the General Carriage Co. at the recent Sheriff's sale will belong to a transit company, and a private automobile service will be inaugurated in addition to its storage and repair facilities. He has already invested upwards of one million dollars.

The Haynes-Apperson Co., Kokomo, Ind., sent a delegation of six of their employees to spend a few days at the Chicago show for the purpose of inspecting the exhibits. The delegation included J. T. Carver, Uriah Derck, Richard Wiley, and W. W. Loper, who are the head of the trimming, painting, machine and body departments of the company, and C. E. Groux and D. C. Spraker from the office force.

The Moffett Vehicle Bearing Co., Chicago, is building a new factory at Saginaw, Mich., to which point it will remove soon.

### Exhibits at the Chicago Show.

The Knox Automobile Co., Springfield, Mass., showed two new gasoline combination vehicles.

The Buffalo Electric Carriage Co., Buffalo, N. Y., exhibited three electric carriages finished, and in wood and iron showing construction.

The Haynes-Apperson Co., Kokomo, Ind., showed one phaeton, a surrey and a light runabout.

The Milwaukee Automobile Co., Milwaukee, Wis., showed its new model touring carriage, one surrey, one solid seat top stanhope, one stick-seat open stanhope, and one solid seat open stanhope; also one large delivery wagon and one small delivery wagon.

The Spaulding Automobile & Motor Co., Buffalo, N. Y., showed a gasoline runabout for two to four passengers.

Beardsley & Hubbs Mfg. Co., Shelby, O., exhibited three gasoline vehicles, including a stanhope, a light touring carriage, and a delivery wagon.

Thos. B. Jeffery & Co., Kenosha, Wis., showed two of their light gasoline runabouts.

The Friedman Automobile Co., Chicago, showed its new gasoline carriage.

The International Motor Car Co., Toledo, O., represented by Githens Bros., its Chicago agents, exhibited six steam, five electric and one gasoline vehicle. The gasoline vehicle was a tonneau of new design. An electric tonneau and a steam touring car were novelties shown for the first time.

The Ohio Automobile Co., Warren, O., represented by Pardee & Co., its Chicago agents, exhibited one gasoline tonneau, one Model F, and one surrey.

The Baker Motor Vehicle Co., Chicago, represented by Pardee & Co., Chicago agents, showed two Baker electric runabouts and two stanhopes.

The Electric Vehicle Co., Hartford, Conn., exhibited six electric vehicles, including a phaeton, runabout, surrey, brougham and one Columbia gasoline vehicle.

The National Vehicle Co., Indianapolis, Ind., represented by Ralph Temple, its Chicago agent, showed ten electric vehicles, including four "Electroble" runabouts, three without top and one with top; two road wagons, one with and one without top; two runabouts, one stanhope, and one dos-a-dos park trap.

The Fournier-Searchmont Automobile Co., Philadelphia, showed a recently imported 1902 model Mors touring car, Henri Fournier's Mors racing car, a new model Searchmont runabout, the new model Searchmont tonneau, and two of the old-style Searchmont carriages.

The Chicago Motor Vehicle Co., Chicago, showed its new Chicago auto-coach in three different patterns, one having four seats, one three seats, and another two seats.

The Chicago Moto-Cycle Co., Chicago, showed two gasoline carriages and one gasoline motor.

The Merkel Mfg. Co., Milwaukee, Wis., showed five gasoline motor cycles.

The Buffalo Automobile & Auto-Bi Co., Buffalo, N. Y., exhibited both gasoline automobiles and motor cycles, the exhibit including a Buffalo Senior carriage, a Buffalo Junior carriage, a No. 3 auto-bi, a No. 4 auto-bi, and a No. 5 auto-bi.

The Duryea Power Co., Reading Pa., represented by Jos. Libal, its Chicago agent, exhibited a gasoline four-wheeled phaeton.

The Foster Automobile Mfg. Co., Rochester, N. Y., through Pardee & Co., its Chicago agents, showed its new light steam carriage, a touring carriage and a surrey.

The Winton Motor Carriage Co., Cleveland, O., exhibited its new gasoline touring car, a phaeton, a stanhope and surrey.

The C. J. Moore Mfg. Co., Westfield, Mass., showed a steam carriage.

The Olds Motor Works, Detroit, Mich., exhibited five gasoline runabouts with and without tops, and one skeleton machine showing construction.

The Overman Automobile Co., New York, showed three Victor steam carriages; also pumps and water gauges.

The U. S. Long Distance Automobile Co., New York, through Ralph Temple, its Chicago agent, showed a gasoline road wagon, a small car, a runabout, and a dos-a-dos.

The Elmore Mfg. Co., Clyde, O., showed two of its new Model G gasoline carriages and one skeleton vehicle showing construction.

The Wisconsin Wheel Works, Racine, Wis., showed two Mitchell gasoline motor bicycles.

The Locomobile Company of America, New York, showed six steam vehicles, nearly all of late design, including both light and heavy carriages. The new style dos-a-dos, and the 1902 model stanhope were illustrated in March issue of THE AUTOMOBILE.

The Crest Mfg. Co., Cambridgeport, Mass., through Pardee & Co., its Chicago agents, showed a Crestmobile runabout.

The Peerless Mfg. Co., Cleveland, O., showed its Model F detachable tonneau car.

The White Sewing Machine Co., Cleveland, O., represented by Ralph Temple, its Chicago agent, showed four steam stanhopes with and without tops, and a phaeton rumble.

The Fanning Automobile Co., Chicago, showed an electric runabout.

Church Mfg. Co., Adrian, Mich., exhibited a Murray gasoline vehicle.

The Truscott Boat Mfg. Co., St. Joseph, Mich., exhibited two patterns of gasoline launches.

The Brown-Lipe Gear Co., Syracuse, N. Y., represented by K. Franklin Peterson, its Chicago agent, showed six models of spur equalizing gears.

The New York Belting & Packing Co., New York, showed the New York long-distance tire in different sizes, including a 4-inch flat-base tire with flanges, and showing the method of attachment.

The Veeder Mfg. Co., Hartford, Conn., showed a line of odometers.

The G. & J. Tire Co., Indianapolis, Ind., showed detachable tires for automobiles.

Joseph Dixon Crucible Co., Jersey City, N. J., showed samples of its graphite specialties, including pure flake graphite for lubricating cylinders and valves of gasoline and steam engines, pipe joint compound, motor brushes for electric vehicles, and chain lubricating graphite.

The Midgley Mfg. Co., Columbus, O., exhibited through K. Franklin Peterson, its Chicago agent, tubular steel wheels.

The B. F. Goodrich Co., Akron, O., exhibited tires of different sizes; also automobile horns in two sizes.

The Goodyear Tire & Rubber Co., Akron, O., showed its detachable and single-tube automobile tires in various sizes.

The National Carbon Co., Cleveland, O., exhibited dry cells, special ignition dry batteries, auto cells, water-proof spark coils, etc.

The Badger Brass Mfg. Co., Kenosha, Wis., showed automobile headlights in full brass, enamel and nickel; also Solar automobile horns.

The Hartford Rubber Works Co., Hartford, Conn., showed Hartford single-tube and Dunlop detachable tires in various sizes, Turner endless tires and a line of mechanical rubber goods.

The Baldwin Chain Co., Worcester, Mass., represented by K. Franklin Peterson, its Chicago agent, showed a detachable block and roller chains and sprockets.

The Sprague Umbrella Co., Norwalk, O., showed canopy tops in various patterns.

The Merriam-Abbott Co., Cleveland, O., showed its small charging plant for electric automobiles.

The Clark Wire Co., Chicago, exhibited samples of its new detachable tire.

The American Roller Bearing Co., Cleveland, represented by K. Franklin Peterson, its Chicago agent, showed artillery wheels on ball-bearing steering axles and in different sizes.

P. J. Dasey, Chicago, the Chicago agent for a number of manufacturers, had an exhibit, including the Clemick-Evinrude 2-cylinder gasoline motor in operation, Dasey 3-cylinder Brotherhood type steam engine, Holley gasoline motors, Motsinger auto sparker, Apple igniter, Locke Regulator Co.'s steam vehicle fittings, Dasey



gasoline motors, Kelley Handle Bar Co.'s burners and generators, Dow spark coils, Dietz automobile lamps, Frantz Body Mfg. Co.'s automobile bodies, Loomis carbureters, and a general line of fittings and sundries; also clothing for automobilists.

The American Tubular Wheel Co., Pittsburg, Pa., showed tubular steel wheels of various sizes. The Diamond Rubber Co., Akron, O., exhibited a complete line of Diamond detachable double-tube tires, endless solid tires, and single-tube tires.

The D. M. Steward Mfg. Co., Chattanooga, Tenn., showed a line of lava insulation for sparking blocks; also samples of a new grease and dirt remover called Stainoff.

The Twentieth Century Mfg. Co., New York, showed Twentieth Century gas and oil lamps for automobiles, including its new acetylene gas auto-touring headlight.

The International Automobile & Vehicle Tire Co., New York, showed samples of the "Endurance" tire of various sizes.

The Whitney Mfg. Co., Hartford, Conn., showed different sizes of the Whitney roller and block chains.

The Everett Electric & Mfg. Co., Indianapolis, Ind., exhibited the Wizard spark igniter.

The Automobile Equipment Co., Chicago, exhibited the Acme steam engine in various sizes, the Hydra double battery, the Dayton Electric Mfg. Co.'s dynamos, Gleason-Peters pumps, and Splittorf spark coils.

The Porter Battery Co., Chicago, exhibited Porter storage batteries for electric vehicles, a sparking battery, and a stationary battery.

The Dayton Motor Vehicle Co., Dayton, O., exhibited a sample of the Dayton running gear; also samples of the Dayton steam engines, boilers, and burners, including a full line of fittings for steam vehicles.

The India Rubber Co., Akron, O., showed various sizes of the Wheeler endless tire. The exhibit also contained what is said to be the largest rubber tire ever built.

The Eastman Metallic Body Co., Cleveland, O., showed three standard metallic bodies in different colors and patterns.

The Rose Mfg. Co., Philadelphia, showed its line of oil and acetylene gas lamps for automobile service.

The Miller-Knoblock Electric Mfg. Co., South Bend, Ind., showed its igniting dynamo and sparking coils.

### Some Miller Specialties.

The engravings herewith illustrate some of the new specialties now being put upon the market by Chas. E. Miller, 97 Reade St., New York. The boiler tube expander, Fig. 1, is made with hardened steel rollers and expanding pin and is especially adapted for the use of builders of automobile boilers and repairers. The usual



FIG. 1. MILLER SPECIALTIES.

size for automobile boilers is  $\frac{3}{4}$  inch outside diameter of the copper tubes and is carried in stock, special sizes being furnished as small as 5-16 of an inch in diameter. By its use the tubes



FIG. 2. MILLER SPECIALTIES.

can be expanded without striking a blow on them, thus rendering them less liable to break. Leaky tubes can be tightened while steam is in the boiler. One expander answers for any thickness of the tube sheet. The manufacturer claims that the expander is easily kept in order and is not liable to break, and rollers being the only thing that can give out and these can be easily

replaced by unscrewing the cap on the end of the body.

Two styles of French automobile horns are shown in the engravings. The No. 1, Fig. 2, is the popular style and is furnished in six sizes. The No. 2, Fig. 3, is the regular style horn fitted with six feet of flexible metallic tubing, nickel plated and polished to correspond with the finish



FIG. 3. MILLER SPECIALTIES.

on the horn. By means of this attachment the horn may be attached to the front of the automobile so that the blast is thrown ahead and thus obviating the noise so close to the ears. The advantage of the flexible tubing is that it will not kink or crush and is practically indestructible. The attachment may be fitted to any automobile horn now in use.

### The Devantery Oil Can.

The accompanying cut shows the Devantery pneumatic oil can. This can is designed with special reference to making the handling of cylinder oil clean and convenient and to overcome the difficulties incident to different temperatures of weather. To this end the can is constructed with a small air pump, a few short, quick strokes of which produces an air pressure on the top of the oil, causing it to flow through the stem as soon as the feed valve is turned. The cylinder cups may be filled readily and the work-



THE DEVANTERY OIL CAN.

ing parts of the motor are easily reached. The device is especially adapted to automobilists' use, the manufacturers claiming the advantage of its cleanliness and the fact that the heaviest grade of cylinder oil can be used without inconvenience. The can is being put on the market by Frank F. Weston, 83 Chambers St., New York City, to whom inquiries should be addressed.

### Business News.

The electric vehicles owned by the General Carriage Co., New York, were sold last month at sheriff's sale to Jos. H. Hoadley.

The New York Belting & Packing Co., Ltd., New York, has just issued two neat little pamphlets containing testimonials from users of the "long distance tire," which the company manufactures.

C. J. Field has moved his sales agency for the New York district for Darracq motor cars to the automobile exchange, 133-139 West 38th St., in order to have a more central location. The general headquarters of the American Darracq Automobile Co. will, however, be retained at 632 Hudson St.

The firm of Craven, Hamilton & Co., 133-139 W. 38th St., New York city, has just been formed for the purpose of conducting an automobile livery. It is proposed to rent automobiles by the hour, day, week or month, as desired. The Panhard and Darracq vehicles will be used, four of which will be put into service to start with, and more added as required.

Manager Lewis of The Automobile Headquarters, 68 Stanhope St., Boston, reports average sales of about one machine a day, or in other words twenty-three machines in twenty-five days. He has been handicapped on account of delay in getting touring cars, but by April 1st it is expected to have a full line in stock. There is unusual interest in automobiles and Mr. Lewis predicts there will be fully twice as many machines sold in and around Boston as last year.

The Washington branch of the International Motor Car Co. will exhibit at the show to be held in Washington, D. C., from April 7th to 12th inclusive, Toledo steam carriages, one being fitted with a phaeton top, and another of the new dos-a-dos type, and a steam touring car similar to the one exhibited at the Chicago show. The Waverley portion of the exhibit will include a model 21 Waverley runabout, a model 22, one of the new surries, and a late pattern of delivery wagon.

## THE Searchmont TOURING ... CAR ...

Is all its name implies, a real touring car. It has wood wheels, long wheel base, double cylinder motor giving ample power for all hills. Large tanks for gasoline, oil and water, large tool box, large luggage hamper, flexible frame and is fully guaranteed. Let us send you booklet telling you all about it.

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Automobiles stored, charged and repaired.  
BROADWAY AUTOMOBILE STORAGE CO., 332  
South Broadway, Los Angeles, Cal.

## WANTED.

A second-hand Boiler or Engine, or both: 1 or  
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T. A. HIGGINS, Lock Box 105, Bellevue. O.

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Young man desires position with manufacture  
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tical experience, and is capable. Address  
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AUTOMOBILE CO., LTD.,

400 Baronne St., New Orleans, La.

## FOR SALE.

Four "Mobiles;" one runabout with top; one  
runabout without top; one dos-a-dos; one  
wagonette seating eleven, has two boilers, and  
steam, water and air pumps. All four machines  
just out of shop and in perfect order.

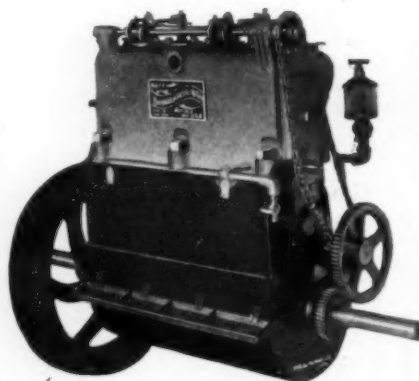
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# Remember The Long Distance Tire



LOCK-FACE SHOWS CROSS-SECTION.

Avoids all possibility of "tire troubles"

**The Winner of the Long Island Endurance Contest, April 20, 1901,** had these tires on the driving wheels. The **thin walled** pneumatics on the front wheels gave out, and have been replaced with the Long Distance Tire.

**The American Machines Finishing First in the New York-Buffalo Endurance Run** were completely equipped with them.

These were the only tires **earning a 100 per cent. Record** in the New York-Buffalo Endurance Run.

These five sets are still in use, having given over four thousand miles service without puncture or other mishap, and with little indication of wear.

**Can You Afford to Experiment with anything else?**

## New York Belting & Packing Co., Ltd.

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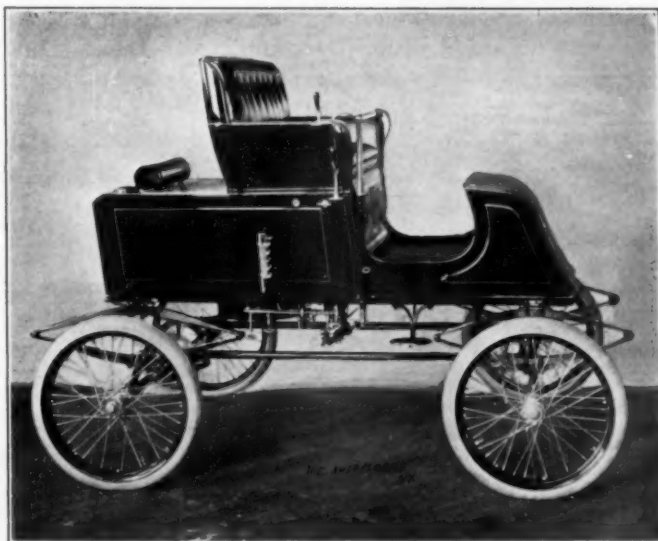
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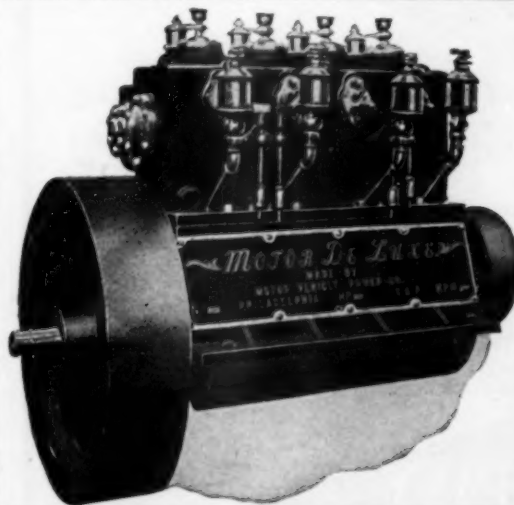
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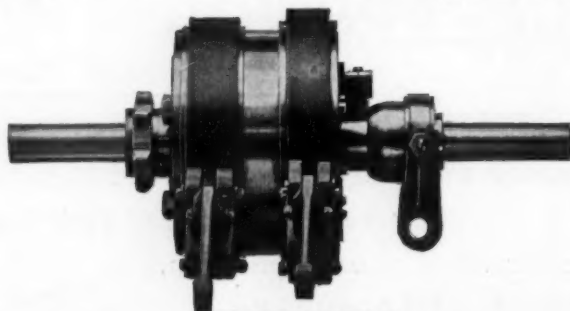
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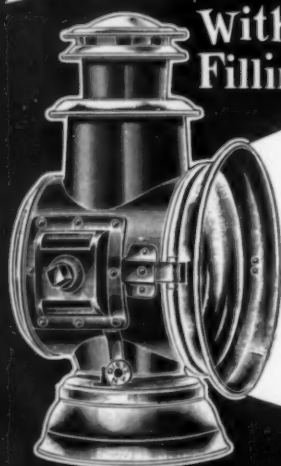
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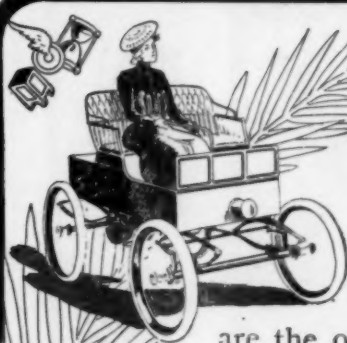
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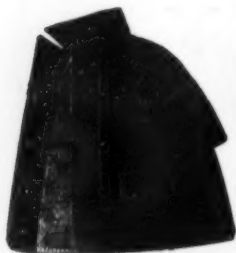
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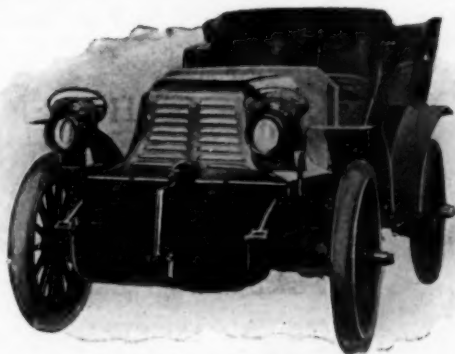
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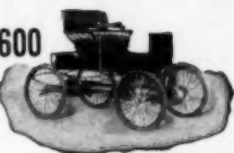
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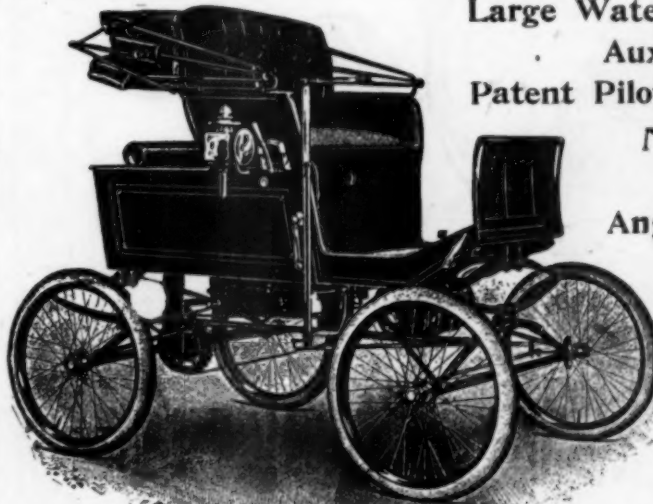
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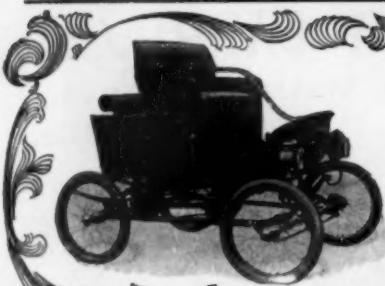
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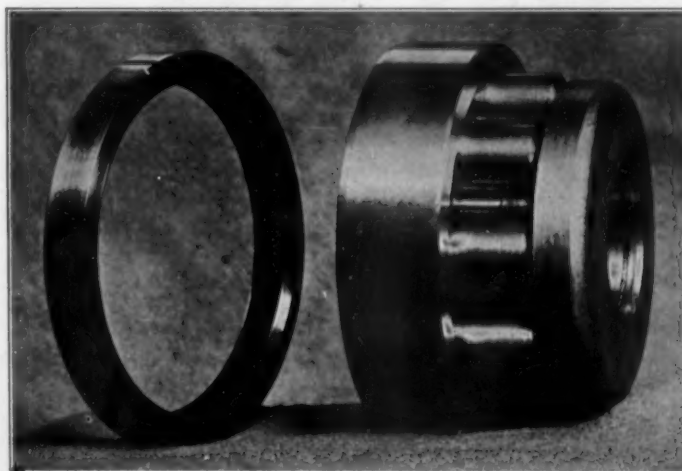
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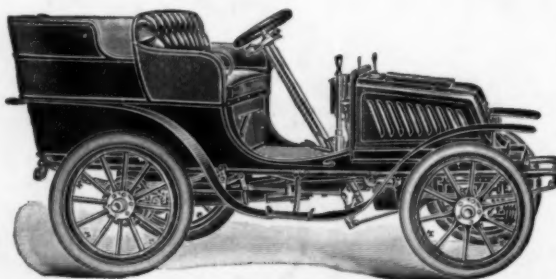
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